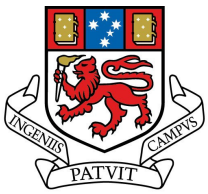

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A comparison of nonsuicidal self-injury in individuals with and without Borderline Personality Disorder

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Abstract

The aim of the investigation was to examine differences in the motivational, psychophysiological, psychological and cognitive responses to nonsuicidal self-injury (NSSI) and other impulsive behaviours of individuals with and without Borderline Personality Disorder (BPD). Also, it was anticipated that results of this investigation could identify whether or not individuals with BPD engage in other impulsive, self-destructive behaviours for the same reasons that they engage in NSSI. Essentially, this part of the research was comprised of an examination of criterion 4 and 5 of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000) diagnostic criteria for BPD. To examine processes at the time of NSSI and impulsive behaviours, a personalised, staged guided imagery methodology was used to test the affect regulation theory of NSSI.

It was expected that both individuals with and without BPD would demonstrate a reduction in negative emotional states with the act of NSSI. However, it was expected that individuals with BPD would report an increase in high arousal positive emotional states, such as excitement, with the act of NSSI whereas individuals without BPD would report an increase in low arousal positive emotional states. This affect regulation function, either positive or negative, also was predicted to distinguish NSSI from control events of an accidental injury and an emotionally neutral event. Interestingly, results indicated that when considering subjective (self-report) data alone, individuals with BPD and individuals without BPD (NBPD) appeared almost indistinguishable in their responses to NSSI. However, when examining objective (psychophysiological) responses, the two groups demonstrated completely different reactions to NSSI. Individuals without BPD demonstrated a

pattern of tension reduction which was consistent with their self-reported reduction in anxiety and tension during the act of NSSI. The BPD group, in contrast, demonstrated the opposite effect, whereby there was an increase in arousal, perhaps suggesting excitement in response to NSSI. Despite this, the BPD group still reported that they felt calm and relaxed as a result of self-injury. This has important considerations for the affective instability of individuals with BPD, particularly in relation to alexithymia.

Secondly, a comparison was made between NSSI and other diagnostically relevant, impulsive behaviours. It was expected that engaging in impulsive behaviours would elicit an excitement response for those with BPD, and a tension reducing function for those individuals without BPD. It also was expected that the response to the impulsive behaviours would mirror the arousal increase, excitement response to NSSI in the BPD group and would mirror the arousal decrease, calm response to NSSI in the NBPD group. Similarly, it was thought that the reasons for engaging in the impulsive behaviours will relate to sensation seeking for the BPD group but a sense of calm for the NBPD group.

Results indicated that there were few differences between the groups in terms of motivational factors associated with impulsive behaviours and, furthermore, psychophysiological responses to these impulsive behaviours did not mirror those demonstrated for NSSI. Results were discussed in terms of support for the fact that NSSI is a unique behaviour, and should not necessarily be included in the DSM-IV-TR (APA, 2000) with other Impulse Control Disorders.

Finally, the motivational and cognitive responses to NSSI for those with and

without BPD were considered. In particular, consideration was given to internal and external motivations to determine if the presence of BPD has an impact on the reasons why people choose to self-injure. It is evident that people with BPD have additional difficulties with interpersonal communication that are not experienced as intensely by people without BPD (Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004). It was thought that these difficulties should influence their motivation for engaging in behaviours that serve to regulate affect because the disturbance in affect may be caused by interpersonal difficulties.

Results for Study 3 indicated that both of the groups endorsed internal motivations for NSSI, but the BPD group endorsed a number of additional external motivations for NSSI indicating that NSSI may be used as a maladaptive tool for communicating distress. In addition, results indicated that individuals with BPD have a range of additional difficulties with anger, irrational beliefs and perceived low ability to control their emotions which likely contribute to NSSI. Interestingly, the BPD group also endorsed the cognition *I like to hurt myself* during NSSI, which further supports the notion that the behaviour may be associated with sensation seeking in this group.

It was concluded that the role of affect regulation in NSSI needs to consider the role of both positive and negative emotions, as well as increase and decrease in arousal, rather than assume that the affect regulatory function of NSSI is always a decrease in negative emotions. This is likely to have important implications for the consideration of BPD in future research as well as treatment options.

Acknowledgements

I wish to thank my supervisor Dr Janet Haines, whose unwavering confidence and trust in my abilities allowed me to develop both personally and professionally. Being able to reconfirm your findings of a tension reduction response to NSSI with a non-Borderline group was a satisfying experience. However, finding the opposite effect for a Borderline group was even more satisfying, and it is an experience that I have truly enjoyed.

Nothing is more curious than the almost savage hostility that humour excites in those who lack it (George Saintsbury, 1845-1933). Humour and common sense are two qualities that sometimes appear to be lacking in the field of clinical psychology. Luckily for me, I have a mentor who has made sure that there were no gaps in my clinical training.

Thanks must also go to Professor Douglas Paton for acting as co-supervisor, and to Dr Chris Williams who has continued to provide valuable assistance in an unofficial capacity along the way.

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No one appreciates the very special genius of your conversation as a dog does (Christopher Morley, 1890-1957). I would like to thank Bella for always listening.

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Finally, thanks must go to the participants who made this project possible. They shared with me some of the most private and complex experiences of their lives, in return for what will hopefully be an improved understanding of the treatment needs for people who engage in NSSI.

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CHAPTER 1

Introduction and overview

Definition of the problem

The literature has used multiple terms to describe the deliberate and nonsuicidal destruction of one's own body tissue, such as self-mutilation (e.g., Favazza, 1998), self-injury (e.g., Osuch, Noll, & Putnam, 1999), self-harm (Skegg, 2005) and nonsuicidal self-injury (e.g., Nock, 2009). Other terms such as deliberate self-harm also may be used in research to describe both self-poisoning and self-injury (e.g., Fortune & Hawton, 2005). For the purposes of this investigation the term nonsuicidal self-injury (NSSI) was used to refer specifically to the deliberate act of damaging or altering one's own body tissue without suicidal intent (Favazza, 1998; Klonsky & Olino, 2008). It is important to consider those acts of self-injury which are nonsuicidal separately from other acts which involve suicidal or parasuicidal intent as there are important motivational and psychological differences associated with differing levels of suicidal intent (Favazza, 1996, 2011; Simeon & Favazza, 2001; Walsh & Rosen, 1988).

NSSI is a relatively common behaviour which occurs in the community without necessarily coming to the attention of clinicians (de Wilde, 2000; Muehlenkamp & Gutierrez, 2004). Rates of NSSI are much higher for adolescents and young adults than they are for children or older adults (Rodham & Hawton, 2009; Ross & Heath, 2002; Selekman, 2009). NSSI occurs consistently across a wide range of geographical locations and cultures (Eddleston, 2000; Hjelmeland et al., 2002; Matsumoto et al., 2005; O'Loughlin & Sherwood, 2005; Yip, Ngan, & Lam, 2003). The behaviours that comprise NSSI often are repetitive in nature (Favazza, 1992; Favazza & Rosenthal, 1993) and NSSI represents a significant social and clinical problem (Andover, Pepper, Ryabchenko, Orrico, & Gibbs, 2005; Favazza,

1996, 2011; Hawton & Blackstock, 1976; Maloney, Shah, & Ferguson, 1987; Nock & Prinstein, 2005; Pattison & Kahan, 1983; Walsh & Rosen, 1988).

NSSI has been observed in diverse psychiatric populations (Darche, 1990; DiClemente, Ponton, & Hartley, 1991; Hollander, 2008; O'Donovan & Gijbels, 2006; Simpson, 1975; Siomopoulos, 1974; Takeuchi et al., 1986; Zlotnick, Mattia, & Zimmerman, 1999), forensic populations (Cookson, 1977; Dear, 2000; Feldman, 1988a; Haines, Williams, & Brain, 1995; Haines, Williams, Brain, & Wilson, 1995; Jenkins et al., 2005; Kuhlmann & Ruddell, 2005; Mohino et al., 2004; Winchel & Stanley, 1991; Yaroshevsky, 1975), and across each age range from children and adolescents to the elderly (Clendenin & Murphy, 1971). Research in this area spans a number of disciplines including medical, psychiatric, forensic and educational. Despite the wealth of research that has been conducted in the area of self-injury, NSSI still remains a behaviour that is not fully understood and is difficult to treat (Skegg, 2005).

Prevalence rates of NSSI are difficult to interpret because studies typically include all types of self-injury, without separating suicidal from nonsuicidal self-injury (Nock, 2009). A number of researchers also have included self-poisoning (i.e., taking an overdose of prescription medication or other substances which are harmful) in their definition of self-injury (e.g., Groholt, Ekeburg, & Haldorsen, 2000; Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999; McLaughlin, Miller, & Warwick, 1996; Milnes, Owens, & Blenkiron, 2002; Nadkarni, Parkin, Dogra, Stretch, & Evans, 2000; Sampson, Mukheerje, Ukoumunne, Mullan, & Bullock, 2004; Taiminen, Kallio-Soukainen, Nokso-Koivisto, Kaljonen, & Kelenius, 1998). This is problematic because it has been demonstrated that self-poisoning is associated with different

motivational factors and is typically suicidal or parasuicidal in intent (Hawton & Harriss, 2007; Hawton, Harriss, Simkin, Bale, & Bond, 2004).

Traditionally, researchers have estimated that rates of self-injury differ between clinical and community samples with one estimate being around 21% for clinical groups, and 4% for community groups (Briere & Gil, 1998). However, noting the prevalence of psychiatric disorders which may be associated with NSSI, Favazza and Conterio (1988) estimated the incidence of NSSI to be approximately 750 per 100 000 population per annum. More recent research has suggested that exact prevalence rates for psychiatric disorders in individuals who engage in NSSI are difficult to estimate, as it is now recognised that NSSI occurs in community as well as psychiatric inpatient populations (Skegg, Nada-Raja, & Moffitt, 2004).

There is now overwhelming evidence that NSSI occurs widely in the non-clinical or non-psychiatric community, and the majority of these individuals are not hospitalised, and they do not come to clinical attention (Rodham & Hawton, 2009). Hence, rates of NSSI which have been based on data from hospital admissions are an unreliable means of assessing the extent of the problem. Approximately 1-4% of adults and 13% to 23% of adolescents report a history of NSSI (Jacobson & Gould, 2007). Other estimates of prevalence rates include 4% among military recruits (Klonsky, Oltmanns, & Turkheimer, 2003), and upwards of 38% of college students (e.g., Brown, Linehan, Comtois, Murray, & Chapman, 2009; Favazza, DeRosear, & Conterio, 1989; Gratz, Conrad, & Roemer, 2002). It is also difficult to clearly separate clinical and community populations as many individuals with psychiatric diagnoses function relatively well within the general community, such as at university. One recent study indicated that psychiatric disorders are prevalent and

persistent among university students, with 60% of students meeting the diagnostic criteria for at least one disorder (Zivin, Eisenberg, Gollust, & Golberstein, 2010). Another study indicated that 10% of students at a large university reported over 100 episodes of NSSI in their lifetime (Gratz et al., 2002).

It needs to be taken into consideration that previous reports of incidence rates of self-injury may have been underinclusive (e.g., Clendenin & Murphy, 1971; Weissman, 1975) or overinclusive (e.g., Kahan & Pattison, 1984; Morgan, 1979) with regard to the range of behaviours that have been considered self-injurious (e.g., overdoses). Throughout the last 20 years, attitudes towards different types of self-injury have changed as previously condemned 'self-mutilative' behaviours, such as body piercing, have become more socially acceptable (Walsh, 2006). In addition, prevalence rates are difficult to establish as a considerable number of individuals who engage in self-injury never access psychological support (Favazza & Conterio, 1989).

Recent research also has been overwhelmingly dominated by use of adolescent populations (e.g., Evans, Hawton, & Rodham, 2005; Fortune & Hawton, 2005; Groholt et al., 2000; Hilt, Nock, Lloyd-Richardson, & Prinstein, 2008; Hurry, 2000; Itzutsu et al., 2006; Laye-Gindhu & Schonert-Reichel, 2005; Nock & Prinstein, 2005; Olfson, Gameroff, Marcus, Greenberg, & Shaffer, 2005; Peterson, Freedenthal, Sheldon, & Anderson, 2008; Rodham, Hawton, & Evans, 2004; Ross & Heath, 2002). There a few problems with this. Firstly, it should be recognised that many adolescents will only engage in episodic NSSI, meaning that their responses to NSSI are likely to be different from individuals who habitually engage in the behaviour (Favazza, 1996, 2011). Also, adolescents are more likely to be influenced

by social contagion effects (Favazza, 2009; Selekman, 2009) and interpersonally themed stressors as reasons for engaging in NSSI (Rudolph, 2002). There also are important facets of personality development and emotion regulation that are still developing in the adolescent, which is one of the primary reasons that the diagnosis of BPD is not appropriate in this age group (American Psychiatric Association [APA], 2000). Clearly then, it is not ideal to make comparisons between adolescent and adult samples in NSSI research.

Rates of self-injury in Australia are similar to the results of the most recent prevalence studies conducted in Canada and Turkey (Laye-Gindhu & Schonert-Reichel, 2005; Ross & Heath, 2002; Zoroglu et al., 2003). However, these rates are larger than those found in earlier studies conducted in the USA (e.g., Garrison, Addy, McKeown, & Cuffe, 1993). A study in South Australia found that rates of self-injury among adolescents ranged from 9% to 30% in those adolescents who obtained high ratings of perceived family dysfunction and depression (Martin, Rozanes, Pearce, & Allison, 1995; Pearce & Martin, 1993, 1994), although this included nonsuicidal and suicidal self-injury. Studies looking at 12 month prevalence rates indicated that an average of 5% (Patton et al., 1997) to 6% of Australian adolescents engage in self-injury (De Leo & Heller, 2004), however, these studies also failed to distinguish suicidal from nonsuicidal behaviour.

One recent longitudinal study conducted in Australia (Moran et al., 2012) indicated that 8% of adolescents aged 14 to 19 years of age reported engaging in self-injury (this age group represented 149 of the total 1802 individuals in the sample). The authors reported that the prevalence rates for cohort members at age 15 was comparable with values reported in previous surveys of adolescents in developed

countries (Brunner et al., 2007; Hawton, Rodham, Evans, & Weatherall, 2002). The study by Moran and colleagues (2012) also indicated that there was a substantial reduction in self-injury during later adolescence and early adulthood with 122 of the 1652 participants engaging in self-injury (7%). Additionally, in a recent review of 53 studies published between 2005 and 2011 on NSSI, a mean lifetime prevalence rate of 18% was reported (Muehlenkamp, Claes, Havertape, & Plener, 2012).

There is much debate about sex differences with regard to these behaviours (e.g., Briere & Gil, 1998; Gratz, 2001; Stanley, Gameroff, Michalsen, & Mann, 2001; Zlotnick et al., 1999). Typically, NSSI is associated with young females (De Leo & Heller, 2004; Hawton, 1986; Hawton, Rodham & Evans, 2006; Laye-Gindhu & Schonert-Richel, 2005; Ross & Heath, 2002; Whitlock, Eckenrode, & Silverman 2006), and the research is certainly dominated by female participants (e.g., Favazza & Conterio, 1989; Graff & Mallin, 1967; Herpertz, 1995; Langbehn & Pfohl, 1993; Rosenthal, Rinzler, Wallsh, & Klausner, 1972). However, a small number of studies have suggested at various times that prevalence rates are higher in males (e.g., Favazza, 1989; Martin et al., 1995; Tulloch, Blizzard, Hornsby, & Pinkus, 1994), and that age of onset for NSSI in males may be lower (Andover, Primack, Gibb, & Pepper, 2010). More recently, researchers are beginning to agree that males are equally likely to engage in NSSI as females, particularly among non-clinical samples (Garrison, Addy, McKeown, & Cuffe, 1993; Gratz, 2001; Klonsky et al., 2003; Muehlenkamp, 2005; Muehlenkamp & Gutierrez, 2004; Zoroglu et al., 2003). One study reported gender differences in the number and frequency of NSSI episodes, and preceding emotional states before NSSI, with men less likely than women to report self-punishment and avoidance as motivations for NSSI (Claes, Vandereycken,

& Vertommen, 2007). It appears that women are more likely to present for treatment (Schmidtke et al., 1996) and, perhaps, it is also the case that they are more likely to volunteer for research investigating NSSI.

Often individuals begin deliberately harming parts of their body where others will not see the resultant physical damage. However, as the behaviour progresses, some cannot resist the urge to cause harm in more obvious places (Conterio, Lader, & Bloom, 1998). Virtually every part of the body reportedly has been subjected to self-injury (Rosenthal et al., 1972; Ross & McKay, 1979; Simpson, 1976; Takeuchi et al., 1986). However, common sites are the arms, legs and thighs (Feldman, 1988a, 1988b; Novotny, 1972; Rosenthal et al., 1972, Takeuchi et al., 1986), chest (Feldman, 1988a, 1988b; Muluka & Dhadphale, 1986; Rosenthal et al., 1972), and stomach (Novotny, 1972; Rosenthal et al., 1972).

Individuals who engage in NSSI are reported to experience greater levels of psychopathology than the general population, such as, Major Depression (MD) (O'Connor, Connery, & Cheyne, 2000), dissociative disorders (Coons & Milstein, 1990; Shearer, 1994a, 1994b; Zlotnick et al., 1996), eating disorders (Paul, Schroeter, Dahme, & Nutzinger, 2002; Shearer, 1994b; Simpson, 1975), substance abuse (Shearer, 1994a; van der Kolk & Fisler, 1995), and Posttraumatic Stress Disorder (PTSD) (van der Kolk & Fisler, 1995). Individuals who engage in NSSI also report significantly more psychological symptoms which may not accompany a clinical diagnosis. The range of symptoms reported may include anger, anxiety and psychotic symptoms (Joiner, Rudd, Rouleau, & Wagner, 2000; Milligan & Andrews, 2005). However, the strongest association between NSSI and psychiatric functioning is that of NSSI and Borderline Personality Disorder (BPD). Within the current

edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000), BPD is the only disorder which includes self-injury as a diagnostic criterion.

The repetitive nature of NSSI is well documented (Brain, Haines, & Williams, 2002; Favazza, 1992; Favazza & Conterio, 1989; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995; Gardner & Gardner, 1975; Graff & Mallin, 1967; Haines, Williams, & Brain, 1995; Kahan & Pattison, 1984; Ross & McKay, 1979; Walsh & Rosen, 1988). However, there is little research which has examined the specific elements that reinforce the repetitive nature of the behaviour. A range of internal and external motivational factors have been identified as contributing to the maintenance of NSSI (e.g., Nock & Cha, 2009), however, it is not known how these motivational factors are related and how different motivational factors may influence different populations.

A range of theories have been proposed to explain the development and maintenance of NSSI. There has been consistent indication in the literature that the individual's emotional state preceding NSSI is negative and that following NSSI, these negative emotional states end (Klonsky, 2007). In this way, NSSI is a behaviour that is negatively reinforced by serving to reduce negative affect to make way for neutral or positive states (Chapman & Dixon-Gordon, 2007; Kemperman, Russ, & Shearin, 1997). The observation that NSSI is an effective tension-reducing mechanism consistently has been observed across a range of psychological disciplines (e.g., Arons, 1981; Bennun [sic], 1984; Brain, Haines, & Williams, 1998a, 1998b; Brain, Haines, & Williams, 2002; Haines & Williams, 2003; Haines, Williams, Brain, & Wilson, 1995; Siomopoulos, 1974). Researchers have theorised

that the tension reduction that the act itself provides serves to reinforce NSSI and maintain the behaviour as an effective coping strategy (Favazza & Conterio, 1989; Haines & Williams, 2003). Researchers have identified the psychophysiological and psychological components of self-injury using guided imagery to depict an actual episode of self-injury (Brain et al., 1998a, 1998b, 2002; Haines, Williams, Brain, & Wilson, 1995). This tension reduction response has been demonstrated with a range of populations including community based and prisoner samples.

It has been recognised that there may be certain similarities or differences between individuals who engage in NSSI depending on whether or not they meet the diagnostic criteria for one or more different types of psychopathology (Darche, 1990; Kahan & Pattison, 1984; Simpson, 1981). Of particular interest are the potential differences between individuals with and without BPD who engage in NSSI. The affect regulation function of NSSI previously has been assumed to be similar for those with and without BPD. Certainly, it has been suggested that NSSI in people with BPD is a dysfunctional strategy that is used to regulate the intense emotional states that characterise the disorder (Kleindienst et al., 2008). Indeed, one study examining emotional states immediately before and immediately after NSSI in people with BPD found the intensely negative emotional states that preceded the behaviour were replaced with a sense of relief and a range of other positive psychological states after the act (Chapman & Dixon-Gordon, 2007).

However, the tension reduction pattern of arousal change to NSSI has not yet been demonstrated in people with BPD. One study, using the personalised, staged guided imagery methodology developed by Haines and colleagues (Haines, Williams, Brain, & Wilson, 1995), investigated evidence for escape conditioning in

people with BPD who engaged in NSSI using respiratory sinus arrhythmia (RSA) and skin conductance response (SCR) (Shaw-Welch, Linehan, Sylvers, Chittams, & Rizvi, 2008). Evidence of a decrease in negative emotional state or tension reduction during the act of self-injury was not found. The study reported to be replicating the guided imagery methodology, however, there were some fundamental differences in the procedure that would make direct comparison of results between studies difficult. In addition, the question of whether NSSI in individuals with BPD serves the same function as previously identified could not be addressed because of an absence of a non-borderline (NBPD) comparison group.

It is the case that others have noted some characteristics of borderline self-injury that do not fit with a tension reduction model of NSSI. For example, it was determined that at least some individuals with BPD "get a kick" out of NSSI (Kleindienst et al., 2008, p.230), suggesting an arousal increase with the act of self-injury. Selekman (2009) suggested that NSSI triggers "a pleasurable sense of well-being and euphoria" (p.9) and can be understood as a "legal high" for some individuals. Kemperman and colleagues (1997) also found that individuals with BPD reported significant mood elevation after engaging in NSSI. Finally, Favazza (2011) indicated that self-stimulation, euphoria and thrill-seeking can all serve as motivations for engaging in NSSI.

Although it could be argued that the behaviour is still serving an affect regulation function, such reports clearly indicate the possibility of changes other than tension reduction. It has not been established if the function of NSSI is the same in individuals with and without BPD. It is possible that people with BPD who engage in NSSI represent a distinct group with specific treatment needs that should be

considered separately from the NBPD self-injuring population. This is important because the research literature has identified an association between individuals with BPD who have a history of NSSI, and premature termination from treatment (Ben-Porath, 2004; Morgan, Barton, Pottle, Pocock, & Burns-Cox, 1976; O'Brien, Holton, Hurren, Watt, & Hassanyen, 1986). This suggests that individuals with BPD who engage in NSSI may have specific treatment needs that currently are not being addressed.

In terms of other differences in NSSI between those individuals with and without BPD, different brain morphology and neuronal activity has been associated with NSSI in individuals with BPD (Groschwitz & Plener, 2012). For example, a study by Kraus and colleagues (2010) reported that imagery of NSSI elicited a significant decrease of activation in the mid-cingulate of individuals with BPD. This was not found for people without the disorder. The authors suggested that for those with BPD, this deactivation may relate to a failure to inhibit or modulate emotional reactivity, which, in turn may increase the urge to engage in NSSI. In addition, there is evidence that in individuals with BPD there are abnormalities in the serotonergic, dopaminergic and opioid systems which lead to analgesia in response to NSSI (New & Stanley, 2010; Sher & Stanley, 2009). These responses are typically not noted for individuals who engage in NSSI without BPD, which strongly suggests that the maintenance of NSSI in BPD has a neurobiological involvement.

It frequently has been identified that NSSI is an impulsive behaviour (Barnes, 1985; Hawton et al., 1999; Herpertz, Sass, & Favazza, 1997; Ojehagen, Regnell, & Traskman-Bendz, 1991; Reynolds & Eaton, 1986; Sher & Stanley, 2009) which becomes a habitual response to negative emotions (Walsh & Rosen, 1988). Despite

this, it is not yet known whether individuals who engage in NSSI demonstrate similarities in their psychological and psychophysiological responses to other impulsive behaviours. This is of interest given the tendency for individuals who engage in NSSI to also engage in other impulsive behaviours such as binge eating, shoplifting, gambling, substance use and other behaviours (Evans & Lacey, 1992; Favazza & Conterio, 1989; Fichter, Quadflieg, & Rief, 1994; Lacey & Evans, 1986; Sher & Stanley, 2009).

For individuals with BPD, recurrent self-injury and impulsiveness are two of the most prominent clinical symptoms (Domes, Schulze, & Herpertz, 2009; James & Taylor, 2008). Hence, an understanding of the fundamental differences in the ways in which these individuals respond to self-injury may be improved by comparing their responses to other impulsive behaviours. This means that it in order to fully understand the processes behind NSSI, it may be necessary to consider the broader context of borderline symptoms.

It is diagnostically relevant that people with BPD engage in a range of impulsive and high risk behaviours other than self-injury (APA, 2000), such as over-spending, reckless sexual behaviour, substance abuse, reckless driving and binge eating. In general, many of these types of behaviours are considered to have an affect regulatory function (Williams, 2006). However, when the nature of these types of behaviours is considered, there is evidence to suggest that the nature of the affect regulation may differ, at least in the NBPD population. For example, whereas reckless sexual behaviour generally is considered to be consistent with novelty seeking (Gil, 2005) and to be a high risk and impulsive but pleasurable experience (Teese & Bradley, 2008), binge eating has been demonstrated to function to reduce

distress and bring about a sense of calm and well being (Selby, Anestis, & Joiner, 2008). Of course, the diverse behaviours are linked by their shared impulsivity and riskiness. However, it may be the case that, for people with BPD, they share other similarities. For instance, they may all stimulate the borderline individual and, in that sense, operate as a self-stimulating mechanism (e.g., Gil, 2005; Gudjonsson, 1987; Teese & Bradley, 2008).

Of course, an affect regulation theory could still be applied to explain the function of such behaviours in individuals with BPD. Indeed, Gross (1999) suggested that it is incorrect to limit affect regulation theory only to a reduction in negative affect. He suggested that theories of affect regulation should encompass increase, decrease and maintenance of negative and positive affect. It may be the case that the affect regulatory function for those with and without BPD is different.

Identification of the factors associated with the maintenance and development of NSSI in individuals with and without BPD has important therapeutic implications. It has been identified that the role of suicidal intent is important when considering treatment for individuals who engage in self-injury (Favazza, 2011; Walsh, 2006). Furthermore, it may be the case that there are important differences to be identified between BPD and NBPD individuals that would influence the ways in which research and treatment for these individuals is conducted.

It is the aim of the current study to further investigate the differences and similarities between BPD and NBPD individuals who engage in NSSI. Further, it is the aim of the current investigation to determine the association between NSSI and other impulsive and diagnostically relevant behaviours in people with BPD.

Overview of the investigation

This investigation constituted an intensive design. It previously has been identified that when conducting clinical research it is sensible to utilise the information that participants are able to provide regarding a range of factors associated with the behaviour in question. This may assist by contributing to the development of a more accurate overview of the behaviour of interest (Grove & Andreasen, 1982). Participants involved in this investigation provided data for each of the three investigations where possible.

Chapter 2 discusses the history of the classification of NSSI, and provides an account of how this behaviour is currently understood within research and clinical practice. For example, the tension-reducing properties of self-injury have been well established and it is understood that engaging in self-injury provides the individual with relief from anxiety as well as other positive psychological and psychophysiological responses (Brain et al., 1998a, 1998b; Haines, Williams, Brain, & Wilson, 1995). Chapter 3 looks more specifically at BPD and provides a detailed discussion of each of the nine diagnostic criteria. It reviews some of the existing literature in which it largely has been assumed that the tension reduction response associated with NSSI must be the same for all individuals who engage in self-injury, regardless of the presence of a BPD diagnosis. In Chapter 4, the role of NSSI is considered within affect regulation theory, and considers the reasons why NSSI may serve a different purpose for those individuals with and without BPD. It also highlights the fact that a direct comparison of self-injury in individuals with and without BPD that utilises objective means has not been made.

Chapter 5 is then dedicated to an empirical investigation of this research

question, and examines the psychological and psychophysiological aspects of NSSI by comparison of these two groups. Results of the first study of this investigation indicated that individuals' psychophysiological responses to NSSI significantly differed depending on the presence or absence of BPD. The NBPD group demonstrated tension reduction in response to NSSI, indicating that self-injury is effective in lowering arousal for these individuals. In contrast, the BPD group demonstrated a significant increase in arousal, which may characterise a self-stimulatory function associated with NSSI for this group. It was interesting that although the NBPD group's subjective responses to NSSI were consistent with the relaxation response, the BPD group provided self-reports that were inconsistent with an arousal increase. That is, despite a significant increase in heart rate, the BPD group reported feeling calm and relaxed at the time. Some possible implications of this inability to accurately identify emotions in BPD individuals are discussed.

Next, Chapter 6 considers the role of impulsivity and fact that NSSI is frequently regarded as an impulsive behaviour, yet direct comparisons of the similarities of NSSI with other impulsive behaviours (e.g., binge eating, shoplifting) have seldom been investigated in terms of their affect regulatory function. Given that self-injurious behaviours and impulsivity are two of the diagnostic criteria for BPD, yet individuals can engage in these behaviours and not meet the other diagnostic criteria for the disorder, it seems important to examine how these behaviours function for each group. For example, it was speculated that due to their interpersonal difficulties, individuals with BPD may have a greater tendency to cite external or operant motivations for engaging in impulsive behaviours. That is, they may engage in impulsive behaviours such as risky sex or property damage for the

purposes of influencing someone else's behaviour. In contrast, individuals without BPD may be more likely to acknowledge internal motivations such as self-punishment or tension reduction associated with impulsive behaviours. In Chapter 7, the affect regulatory function of NSSI was compared with a range of other impulsive behaviours (e.g., binge eating, substance use) in order to investigate whether the psychological and psychophysiological responses to these behaviours would be similar or dissimilar. For example, the research literature has suggested that binge eating may involve a process of tension reduction that is similar to NSSI (Selby et al., 2008). Again, the results in Study 2 were compared between individuals with and without BPD using a combination of psychological tests, imagery scripts, and participants' self-report ratings of pre and post emotional states associated with the impulsive behaviours that they had engaged in.

Results from Study 2 indicated that there were very few differences between the groups in terms of frequency and duration of engaging in impulsive behaviours, and in associated help-seeking. A greater number than expected of BPD individuals engaged in binge eating and in impulsive damage to property, but there were no other significant differences. The groups also did not differ in terms of their motivations for engaging in impulsive behaviours. When results from the two groups were combined, depression was the primary motivation for engaging in impulsive behaviours. Similarly, for both groups internal motivations such as avoidance and intropunitiveness were rated higher than external motivations such as extrapunitiveness, modelling and operant motivations. These results were consistent with previous research for the NBPD group. However, the results may provide further evidence that individuals with BPD have a fundamental difficulty in

accurately recognising and communicating their emotional experiences.

When responses to impulsive behaviours were compared in terms of participants' affective state before, during and after engaging in the behaviour, there were again no group differences between the BPD and NBPD group. However, there was a significant main effect for NSSI, where participants felt more unhappy and more distressed before engaging in NSSI than they did during and after. Similarly, they felt less calm and/or excited before engaging in NSSI than they did during or afterwards. When participants' responses to each of the impulsive behaviours were considered separately, it was evident that other impulsive behaviours (e.g., binge eating, gambling) did not particularly mirror either the tension reduction, or self-stimulation patterns of NSSI as predicted. However, there was a significant group result for excitement, whereby the BPD group were more excited before engaging in risky sex than the NBPD group.

In order to try and delineate further the reasons why individuals choose to engage in NSSI, and any similarities or differences in responses to NSSI for BPD and NBPD groups, Chapter 8 discussed the motivational, symptomatological and cognitive concomitants of NSSI. Existing literature seems to suggest that individuals without BPD are more likely to engage in NSSI for internal motivations such as tension reduction or self-punishment. In contrast, it may be expected that due to their interpersonal difficulties, the motivations of individuals with BPD may be more external in nature, such as engaging in NSSI to attempt to influence the behaviour of others. In addition, it was deemed important to consider cognitive factors such as irrational beliefs, perceived stress and perceived control of one’s internal state when examining motivations for NSSI. Finally, this chapter also considered the potential

influences of comorbid or co-occurring Axis I and Axis II disorders on NSSI, and a detailed examination of the role of comorbidity was considered.

In Chapter 9, the results from these considerations were discussed. Study 3 demonstrated that although internal motivations for NSSI (e.g., tension reduction) may be endorsed by both individuals with and without BPD, individuals with BPD are more likely to endorse additional external, operant motivations for the behaviour. Hence, NSSI may be used by this group as a maladaptive communication strategy. In addition, individuals with BPD are more likely to state that they like to hurt themselves, which is consistent with the increase in psychophysiological arousal noted for this group in Study 1. Consistent with BPD psychopathology, individuals in the BPD group demonstrated scores that were higher in trait anger, impulsiveness, and perceived stress in comparison to the NBPD group. BPD individuals also demonstrated lower levels of perceived ability to control anger and other emotions, and a complete absence of perceived reasons for living despite low to moderate suicide scores and an absence of clinically significant depression. They also endorsed a number of irrational beliefs, demonstrating a level of rigidity in thinking that was not evident for the NBPD group. These results were explained in terms of the extreme difficulties that individuals with BPD have in identifying, regulating and controlling their emotions, as well as additional difficulties in communicating their distress to others.

Finally, Chapter 10 provided a summary and further discussion of the results of the present research. Results highlighted the fact that although the function of NSSI appears on the surface to be quite similar for individuals with and without BPD, there are important differences between these two groups in terms of the affect

regulatory function of the behaviour. Results of the current study have also supported the notion that for individuals presenting for treatment of NSSI, screening for the presence of BPD may be an important necessity as it informs best practice for treatment. For example, it may be the case that skills taught in Dialectical Behaviour Therapy (DBT) need to incorporate specific strategies to target self-stimulatory as well as self-soothing or calming properties of NSSI. These considerations are discussed in detail in the final chapter.

Prior to embarking on this investigation it was necessary to precisely define the behaviours in question and to explain the sequelae of these behaviours in individuals with and without BPD. The following literature chapters aim to address these issues.

CHAPTER 2

Classification of self-injury

Nomenclature in the self-injury research literature

There are many terms that have been used to describe acts of intentional, physical harm against the self such as self-mutilation (Favazza & Rosenthal, 1990; Walsh, 2006), self-mutilative behaviour (Nock & Prinstein, 2004), deliberate self-harm (Pattison & Kahan, 1983), self-harm (Harris, 2000), self-harm behaviours (Sansone & Levitt, 2002); self-injurious behaviours (Paul et al., 2002), self-injury (Solomon & Farrand, 1996), self-wounding (Huband & Tantam, 2004) and suicidal gestures (Fisch, 1954; O'Carroll, Berman, Maris, & Moscicki, 1996; Tucker & Gorman, 1967). The fact that there are over 33 different terms and definitions that have been used to describe both suicidal and nonsuicidal behaviour further complicates understanding (Muehlenkamp, 2005). Despite the obvious need to standardise and narrow the terms used, this has not happened. Part of the problem lies in the debate surrounding the role of suicidal intent, and whether a classification system that takes intent into account is better understood in terms of categories or dimensions.

The term 'deliberate self-harm' (Kahan & Pattison, 1984; Pattison & Kahan, 1983) was favoured among researchers because it was originally used to describe self-destructive acts where the intent to die was not apparent (Morgan, Pocock, & Pottle, 1975). Therefore, it was widely believed to be a sufficient term for its purpose because it is free from implied negative connotations of suicidal intent. Despite this, a problem exists in that some researchers use the term self-harm or self-injury to refer to an extremely broad range of behaviours, such as self-poisoning, including those who originally supported its use. There are also geographical differences in the use of terminology. For example, in the United States the term deliberate self-harm is

used to refer to NSSI, but in the UK the term is also used to refer to self-poisoning (Claes & Vandereycken, 2007; Jacobson & Gould, 2007). There is research evidence to suggest that self-poisoning is a unique clinical behaviour which should be considered separately from self-injurious acts such as cutting, because the motivations behind the behaviour are different (Nock, 2009; Walsh & Rosen, 1988). Similarly, some researchers continue to use the terms deliberate self-harm and attempted suicide interchangeably to describe similar behaviours (Wyder, 2004).

A standardised definition for the behaviours under consideration is an ideal which has not been consistently maintained in the literature. One term, nonsuicidal self-injury (NSSI), appears to be the preferred term, although, again geographical location has some influence. The earliest use of the term 'nonsuicidal self-injury' appears to have been adopted by Shearer (1994b) in a study of the phenomenology of the behaviour in BPD. However, it is only recently that use of the term has become more established among researchers in the field (e.g., Brown, Comotois, & Linehan, 2002; Glenn & Klonsky, 2010; Kleindienst et al., 2008; Klonsky & Olino, 2008; Muehlenkamp & Gutierrez, 2004; Nock & Kessler, 2006; Nock & Prinstein, 2004; Stanley, Brodsky, Nelson, & Dulit, 2007; Whitlock et al., 2006). Those researchers who have previously used the terms self-mutilation and deliberate self-harm in their work are now making a point of stating that NSSI is a more appropriate term (e.g., Nock & Favazza, 2009; Rodham & Hawton, 2009).

Hence, for the purposes of the current investigation, the term 'nonsuicidal self-injury' (NSSI) is used. In instances where it is difficult to ascertain the level of suicidal intent associated with the behaviour from a particular study, the more general term 'self-injury' will be used. As discussed in Chapter 1, it is likely that

there are fundamental differences between self-injury that is nonsuicidal and those behaviours which are parasuicidal or suicidal in intent (Nock, 2009; Walsh, 2006). Therefore, research referring to NSSI only was used where possible. The following section outlines the origins of some of these terms, and critically evaluates their usage.

Wrist-cutting syndrome

During the 1960s, a specific clinical interest in wrist-cutting emerged (Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969). Graff and Mallin first reported the existence of a group of young, attractive, and intelligent women who habitually engaged in wrist-cutting, and Pao described a group of females who used cutting as an ‘obsessive’ device aimed at reducing tension rather than attempting suicide. In the 1970s, Rosenthal et al. (1972) proposed the existence of a separate 'wrist–cutting syndrome', and Simpson (1975) suggested that self-cutting could be an act of 'antisuicide' to recover from a depersonalised state. However, this notion of a specific clinical phenomenon was first challenged in 1971 when researchers Clendenin and Murphy completed a two year examination of police records regarding all reported suicide attempts. By comparing individuals who cut their wrists with those who used other methods, evidence which supported the ‘typical’ wrist-cutter profile was not found. These findings were replicated in 1975 by Weissman who used a sample from a local medical complex, rather than a private psychiatric hospital. Since this time, the notion of the young female wrist-cutter as a psychological profile has received little acknowledgement as anything more than a popular media caricature.

In contrast to other sites of the body, cutting the wrists is more often than not regarded as a suicidal gesture, despite the fact that researchers such as Walsh and Rosen (1988) have previously suggested that the lethality of the behaviour was low. People who self-injure, who are not suicidal, may cut their wrists just as they do other parts of their body, meaning that the gesture of cutting ones' wrists is not necessarily as significant as previous research indicated. Although there are those who self-injure whose wrist-cutting could be correctly identified as parasuicidal or suicidal, these individuals are representative of a very small clinical group. These individuals are generally part of the psychiatric in-patient population, or prison in-mates (Cookson, 1977; Dear, Thomson, & Hills, 2000; Lanes, 2009; Lohner & Konrad, 2006). Given the problems associated with this term, early attempts were made to find a more appropriate way of describing this behaviour.

Deliberate self-harm syndrome

In the 1970s, researchers in Britain began referring to 'deliberate self-harm' (e.g., Morgan, Burns-Cox, Pocock, & Pottle, 1975) or 'non-fatal deliberate self-harm' (e.g., Morgan, Pocock et al., 1975) as a behaviour which could be distinguished from a suicide attempt. One of the definitions of deliberate self-harm used by Morgan, Burns-Cox et al., (1975) was "a non-fatal act, whether physical injury, drug overdose or poisoning, carried out in the knowledge that it was potentially harmful" (p.564). The recognition that there was an increasing trend for the behaviour prompted some researchers to suggest that self-injury may be best classified as its own syndrome (e.g., Pattison & Kahan, 1983). A proposal for a 'deliberate self-harm syndrome' to be included in future editions of the DSM was

proposed (e.g., Favazza, 1996; Favazza & Rosenthal, 1993; Muehlenkamp, 2005; Pattison & Kahan, 1983), however, this inclusion has yet to be made (Nock & Favazza, 2009). There appears to have been some hesitancy to include NSSI as a separate syndrome, perhaps due to the fact that self-injury comprises a range of diverse behaviours which can be understood as a symptom of a clinical disorder (Nock & Favazza, 2009), a maladaptive coping strategy (Haines & Williams, 2003), or a practice which is socially sanctioned and not necessarily indicative of psychopathology (Favazza, 1996, 2009).

In addition, the current links between self-injurious behaviours, such as cutting, and other behaviours such as self-poisoning need to be more firmly established. Previously, the conception of a link between self-injury and self-poisoning did little other than highlight the fact that the two behaviours are deliberately self-inflicted and that they cause self-harm (Haines, 1994). However, there is important evidence to suggest that there are quite important differences between self-injury such as cutting, which is typically nonsuicidal, and other behaviours such as self-poisoning and risk-taking behaviours (e.g., reckless driving), which may or may not be suicidal in their intent (Nock & Favazza, 2009; Walsh, 2006).

Factors that distinguish NSSI from parasuicide and attempted suicide

Early conceptualisations of self-injury were based in psychodynamic theory where self-injury was believed to be a symbolic, suicidal gesture (Menninger, 1935). Previous literature also reflects a wide spread belief in self-injury as being suicidal in nature (e.g., Friedman, Glasser, Laufer, Laufer, & Wohl, 1972; Gossop, Cobb, &

Connell, 1975; Hawton & Blackstock, 1976; Lewinsohn, Rohde, & Seeley, 1996; Robertson, Campbell, & Crawford, 1987). Self-injury has been referred to as attempted suicide (e.g., Hendin, 1950; Schmidt, O'Neal, & Robbins, 1954; Stengel, 1964), parasuicide (e.g., Shneidman, 1985) and suicidal gestures (Stanley, 1969) which demonstrates that self-injury has typically been considered a derivative of suicidal behaviour (Walsh, 2006; Walsh & Rosen, 1988). Indeed, there are instances where implications of intent are often assumed rather than measured objectively with standardised assessment instruments such as the Beck Suicide Intent Scale (Camidge, Wood, & Bateman, 2003; Nock & Kessler, 2006).

Menninger (1935) was the first to distinguish between self-injury and suicide. However, it has still taken decades for the majority of researchers in the area to clearly delineate between NSSI and suicidal behaviours (Darche, 1990). It is now being recognised that intent needs to be taken into consideration when discussing self-injurious behaviours (Favazza, 1998; Nock & Kessler, 2006; Ross & McKay, 1979; Simpson & Porter, 1981; Suyemoto, 1998). One of the major reasons that it is important to consider these behaviours separately is that treatment goals are likely to be different (Schwartz, Cohen, Hoffman, & Meeks, 1989; Solomon & Farrand, 1996). Favazza (1998) stated that nonsuicidal forms of self-injury represent a maladaptive form of self-help, often intended as antithetical to suicide. Other researchers have demonstrated support for this view, describing self-injury as a maladaptive coping strategy (Brain et al., 1998a, 1998b; Haines, Williams, Brain, & Wilson, 1995; 2003; Solomon & Farrand, 1996). Self-injury has been reported to alleviate feelings of numbness (depersonalisation) (Favazza, 1989; Favazza & Rosenthal, 1993), to relieve tension and emotional distress (Brain et al., 1998a,

1998b; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Haines, Williams, & Brain, 1995; Herpertz, 1995; Pao, 1969; Solomon & Farrand, 1996), and to assist in regaining a sense of being alive (Walsh & Rosen, 1988). It is certainly the case that the majority of self-injurious behaviours such as self-cutting typically are low in suicidal intent (Schaffer, Carroll, & Abramowitz, 1982; Stanley et al., 2001) and the behaviours represent little risk to life (Hawton et al., 2004.). Walsh (2006) highlighted the important fact that for most individuals who engage in self-injury, "the intent of the self-injuring person is not to *terminate* consciousness, but to *modify* it" (p.7, italics sustained).

However, it would not be accurate to state that there is no relationship between self-injury and suicide, as individuals who engage in self-injury also may make suicide attempts (Favazza, 1992; Herpertz, 1995; Langbehn & Pfohl, 1993; Schwartz et al., 1989). Approximately 28-41% of individuals who engage in NSSI report having suicidal ideation at some point (Favazza, 1996; Pattison & Kahan, 1983) and 55-85% have a history of at least one suicide attempt (Stanley, Winchel, Molcho, Simeon, & Stanley, 1992).

Individuals may also engage in self-injurious behaviours that are parasuicidal in nature. Parasuicide is a term which was first adopted by Kreitman and colleagues in 1969. It has been used to describe behaviour that mimics suicidal behaviour but is carried out for reasons other than death (Kreitman, 1977; Kreitman, Tata, Greer, & Bagley, 1969). The processes that drive parasuicide can be interpreted as operant in nature, in that the behaviour often follows relationship discord and is aimed at influencing someone else's response (Bostock & Williams, 1974; Henderson & Lance, 1979; O'Connor, Sheehy, & O'Connor, 2000). Parasuicide, like NSSI,

typically represents lower risk to the life of the individual than does a genuine suicide attempt (Sansone, Songer, & Sellbom, 2006). In general, parasuicidal behaviours are far more likely to be associated with self-poisoning than with other methods of self-injury such as self-cutting (Walsh, 2006).

It has been suggested that these suicidal and parasuicidal behaviours are distinguishable from acts of NSSI (Bach-y-Rita, 1974; Favazza, 1989; Nelson & Grunebaum, 1971; Rosenthal et al., 1972; Solomon & Farrand, 1996; Stanley et al., 1992; Walsh & Rosen, 1988). For example, when attempting suicide, individuals may use a different method (e.g., self-poisoning) from that which they use to engage in NSSI (Favazza & Rosenthal, 1993; Rosenthal et al., 1972).

Some individuals may attempt to commit suicide after a number of years of engaging in NSSI (Pattison & Kahan, 1983; Robinson & Duffy, 1989). The desperation of the individual to try to control repetitive self-injury may lead to 'true' suicide attempts (Favazza & Conterio, 1989). Similarly, as the intensity of self-injury escalates, so does the risk of accidental death (Bancroft & Marsack, 1977; Favazza & Conterio, 1988). The presence of NSSI does not necessarily indicate the complete absence of suicidal ideation (Favazza & Conterio, 1989; Pattison & Kahan, 1983) or previous suicidal behaviour (Briere & Gill, 1998). This certainly is the case for certain populations such as those individuals with BPD. Indeed, Criterion 5 refers simultaneously to "recurrent suicidal behaviour, gestures, or threats, or self-mutilating behaviour" (p. 710, APA, 2000). For these individuals, different episodes of self-injury are likely to be associated with varying degrees of suicidal intent. In the majority of individuals who do not meet the diagnostic criteria for BPD or other psychiatric diagnoses such as Major Depression, suicidal intent is usually absent.

The majority of individuals who engage in self-injury are able to distinguish NSSI from suicide attempts (Schwartz et al., 1989; Simpson, 1981; Solomon & Farrand, 1996), but this may not always be the case (Haines, Williams, & Brain, 1995). In some instances, the external motivations for the individual, such as a desire to gain sympathy or avoid stigmatization and punitive responses, may influence the way that s/he presents to emergency departments for treatment (Favazza & Conterio, 1989; Solomon & Farrand, 1996; van Moffaert, 1990; Walsh & Rosen, 1988). In addition, some individuals are unable to explain why they engage in self-injury (Walsh & Rosen, 1988), which potentially reflects a lack of understanding of their own self-injurious behaviour (Haines, Williams, & Brain, 1995). Despite these difficulties, researchers have attempted to identify a range of factors that can reliably distinguish between self-injurious and suicidal behaviours (Walsh & Rosen, 1988). The following section outlines some of these factors.

Intent

Some authors have maintained that defining self-injury on the basis of intent is impractical (Morgan, 1979; Ross & McKay, 1979) and that it is preferable to consider self-injurious behaviours as similar behaviours occurring along a continuum of lethality (Linehan, 1993; Stanley et al., 1992; Zlotnick et al., 1997). Despite this, the current investigation is based on Favazza and Conterio's (1988) argument that a distinction of intent is a useful and necessary element in the conceptualisation and treatment of self-injury.

It previously has been identified that some individuals are unable to explain why they engage in self-injury (Walsh & Rosen, 1988). For this reason, some authors

have suggested that simply asking people to explain their motivations may not be a reliable method of establishing intent (Favazza & Conterio, 1989). Furthermore, research has demonstrated that any act of self-injury may be open to reinterpretation when considered in retrospect (Brain et al., 1998a).

Traditional measures of suicidal intent have been problematic when applied to intent associated with self-injury, including NSSI (Haines, Brain, & Williams, 1998). Such measures typically have incorporated the circumstances surrounding the act to establish a total intent score. This creates some difficulty in assessing NSSI in that endorsement of items assessing isolation, taking precautions against discovery and not acting to gain help are indicative of greater suicidal intent (Beck, Morris, & Beck, 1974; Pierce, 1977, 1981).

However, in cases of NSSI, these features may not represent greater risk to the individual. Prior to engaging in NSSI, individuals usually seek privacy and solitude if not already alone (Feldman, 1988a, Gardner & Gardner, 1975; Simpson, 1976). In addition, the reluctance of individuals who engage in NSSI to seek help from others has been documented (Favazza & Conterio, 1989; Simpson, 1976). It is likely that these actions represent a desire for privacy and a view that help is unnecessary, particularly when injuries are superficial and suicidal intent is absent or low. Therefore, it is important to recognise that these characteristics of self-injury may result in artificially inflated estimates of suicidal intent associated with self-injury as measured by the available scales for assessing suicidal intent (Haines et al., 1998). At present, many standardised instruments for measuring the intention specifically associated with self-injury (such as the Suicide Attempt Self Injury Interview [SASII], Linehan, Comtois, Brown, Heard, & Wagner, 2006) have not

been validated with non-patient populations, nor have they been validated with Australian samples.

Nevertheless, attempts to determine motivation as a distinguishing factor of NSSI should not be dismissed as research has indicated that individuals have a variety of motivations for engaging in self-injury (Bennum, 1983; Favazza, 1989; Favazza & Conterio, 1989; Pattison & Kahan, 1983; Walsh & Rosen, 1988). For example, suicidal individuals tend to experience enduring periods of helplessness and a constriction of cognitive processes that precipitate ambivalence towards death as suicide is considered the only option (Shneidman, 1985; Walsh & Rosen, 1988). In contrast, NSSI represents a response to acute distress and the individual recognises a quick way of alleviating these feelings (Podvoll, 1969; Simpson, 1976). A detailed discussion of motivational factors associated with NSSI will be presented in Chapter 8.

Lethality

The level of physical damage produced by self-injury has been identified as a key feature in distinguishing nonsuicidal from suicidal injury (Walsh & Rosen, 1988). As mentioned previously, NSSI is typically of low lethality and unlikely to result in death (Favazza & Simeon, 1995; Feldman, 1988a; Pattison & Kahan, 1983; Ross & McKay, 1979; Simpson, 1976). For example, self-cutting is the most common form of self-injury yet it accounts for only 1.4% of all suicides (Walsh, 2006). Furthermore, in cases where death does occur this is usually the result of serious injury to the jugular or carotid artery, not superficial cutting to the arms and legs, as is most common with self-cutting (Walsh, 2006). Generally speaking,

individuals with an intention to die tend to engage in more lethal behaviours (Beck, Beck, & Kovacs, 1975; Brown, Henriques, Sosdjan, & Beck, 2004). However, in cases of unequivocal death (i.e., where the coroner determined that cause of death was unambiguous and could only lead to one conclusion) this still raises the issue of assumptions that are made about suicidal intent when injuries are more serious. Suicide research has indicated that access to means and level of knowledge of physiology are important factors when considering intent to die (Beck et al., 1975). However, this is less of an issue with behaviours such as self-cutting where the individual is more easily able to gauge the damage sustained by his/her injuries.

However, as self-injury becomes habitual, the risk to the individual does increase. There is an increased likelihood of accidental death with repeated risk taking behaviour as behavioural repetition may have a desensitising effect thus increasing the chances of the individual taking greater risks (Bancroft & Marsack, 1977; Favazza & Conterio, 1988). This has been demonstrated in individuals who engage in parasuicidal and suicidal behaviours. In one study comparing aspects of completed suicide and parasuicidal behaviour, 28% of participants who completed suicide had a history of previous hospital admission for parasuicidal behaviour, most often self-poisoning (Garzotto, Buglass, Holding, & Kreitman, 1977). The greater proportion of the individuals with a history of parasuicidal behaviour died from self-poisoning from prescription drug overdoses. On the other hand, individuals who completed suicide without a history of parasuicide tended to die from more lethal, violent means such gun shot.

A correlation between lethality and suicidal intent is still difficult to gauge. Previous research has identified that suicide attempts made by individuals who

engage in self-injury are of lower lethality than attempts made by individuals who do not engage in self-injury (Langbehn & Pfohl, 1993). In some instances it is difficult to determine from the research literature whether suicide attempts are an extension of self-injurious behaviour for these individuals or whether they represent a genuine wish to die. Therefore, the degree of physical damage inflicted may be helpful in assessing intent but it is an insufficient means to do so in isolation (Nielsen, Stenager, & Brahe, 1993).

Behavioural repetition

The repetitive nature of self-injury has been established (Favazza & Conterio, 1988, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Kahan & Pattison, 1984; Morgan, 1979; Ross & McKay, 1979). Individuals who engage in NSSI may endorse hundreds or thousands of separate incidents, whereas the number of suicide attempts tends to be much lower (Walsh & Rosen, 1988). Hence, it would seem that a consideration of behavioural repetition may clearly distinguish NSSI from suicide attempts. However, this distinction becomes problematic when considering parasuicidal behaviours. For example, parasuicidal self-poisoning tends to be repetitive (Bancroft & Marsack, 1977; Hjelmeland, 1996; Robertson et al., 1987; Sakinofsky, Roberts, Brown, Cumming, & James, 1990; Smeeton & Wilkinson, 1988). Furthermore, researchers have stated that repetitive self-poisoning represents the establishment of a maladaptive coping strategy in the same way as NSSI (e.g., Sakinofsky et al., 1990). Another problem lies in the fact that NSSI may be habitual and repetitive, or it can be episodic with fewer lifetime events (Favazza, 2009).

Method of injury

Individuals who engage in NSSI tend to use multiple methods (Favazza & Rosenthal, 1993; Herpertz, 1995; Langbehn & Pfohl, 1993; Kahan & Pattison, 1984; Morgan, 1979; Ross & McKay, 1979; Schwartz et al., 1989). In contrast, individuals who have attempted suicide more than once typically use the same method each time (Walsh & Rosen, 1988). Despite popular misconception, individuals who attempt suicide using self-cutting and other self-injurious behaviours are rare (e.g., Favazza, 1998; Ohshima & Kondo, 1997; Walsh, 2006) and, as previously stated, the most common form of self-injury, self-cutting, results in death for only 1.4% of those individuals who die by suicide (Walsh, 2006). Walsh (2006) also pointed out that the type of cutting that is likely to result in death is severing the carotid artery or jugular veins in the neck, not from cutting of the arms or legs. The majority of research examining attempted suicide pertains to self-poisoning because, as mentioned previously, this method tends to be repetitive and is one of the few methods that represents variable risk to life (Favazza & Rosenthal, 1993; Walsh & Rosen, 1988). This variability is largely dependent on access to means as well as the individual's understanding of pharmacodynamics and pharmacokinetics.

Summary

In summary, it can be identified that the term 'attempted suicide' should be reserved for situations in which the intent behind the self-injurious act is actually known and considered to be associated with a desire to end life (Welch, 2001). Researchers have proposed that consideration of behavioural intent, lethality, repetition, and methods of injury may enable nonsuicidal behaviours to be

distinguished from those which are suicidal or parasuicidal in nature (Walsh & Rosen, 1988). However, the intended meaning of an act of self-injury is not always easily determined and the process of assessing intent is difficult (Nock & Kessler, 2006; Welch, 2001). This is particularly true for individuals whose motivations for self-injury fluctuate between suicidal, parasuicidal and other reasons at different times. This is a trend which has been identified with specific populations such as individuals diagnosed with BPD (Stanley et al., 2001).

It is likely that additional factors are required to accurately distinguish nonsuicidal and suicidal self-injury. However, ignoring the intent behind self-injury can lead to an overestimation of the prevalence of suicide attempts and, thus, hinder the identification of risk factors specific to suicide attempts (Nock & Kessler, 2006). Furthermore, clinicians who do not give careful consideration to the intent behind their patient's self-injury are less likely to establish adequate rapport and the development of appropriate treatment goals.

Direct and indirect risk-taking behaviours

In his review of self-injurious behaviours (SIB), Walsh (2006) delineated between direct and indirect forms of self-injury. This classification, which extends from earlier work by Pattison and Kahan (1983), organises a wide range of self-destructive behaviours into a logical framework. Direct self-injury involves immediate tissue damage and the intent behind the behaviour is generally unambiguous. Direct self-injury may range from high-lethality behaviours (suicidal) through to low-level (self-injurious) behaviours. It is the latter behaviours which generally are the focus of self-injury research and also the focus of the current

research.

In contrast, indirect self-injury refers to behaviours in which the damage is usually cumulative and/or deferred as opposed to immediate (Walsh, 2006). Substance abuse, failing to take medication or bodily harm sustained by eating disordered behaviours fall within the definition of indirect deliberate self-injury. It is worth noting that many individuals who engage in self-cutting or self-burning also engage in behaviours such as self-starvation, medication-abuse and other means of cumulative bodily harm which they may consider to be a method of self-injury but researchers would not (Nock, 2009).

Risk-taking behaviours also are classified as indirect SIB. Walsh (2006) outlined three types of risk taking behaviour: situational (e.g., walking alone at night in a high crime area), physical (e.g., walking into high speed traffic) and sexual (e.g., having unprotected sex with multiple unknown sexual partners). The comorbidity and interrelatedness of direct and indirect SIB has been discussed elsewhere (e.g., Favazza & Conterio, 1989; Simeon & Hollander, 2001; Walsh & Frost, 2005 in Walsh, 2006). Some researchers have suggested that there may be a relationship between negative body image, self-injury and risk-taking behaviours (e.g., Carroll, Riffenburgh, Roberts, & Myhre, 2002; Cross, 1993; Granner, Black, & Abood, 2002; Windle, Miller-Tutzauer, & Domenico, 1992). In particular, it appears that the most frequently reported risk-taking behaviours associated with self-injury are risky sexual activities and substance use (Muehlenkamp, Swanson, & Brausch, 2005). However, Muehlenkamp et al. (2005) were unable to find support for a relationship between self-injury and risk-taking. The authors pointed out that research in this area remains exploratory as there have been very few studies examining the ways in which self-

injury may be related to impulsive and risk-taking behaviours.

Given that there is a significant relationship between Major Depressive Disorder and NSSI (e.g., Bennum & Phil, 1983; Glassman, Weierichb, Hooleya, Deliberto, & Nock, 2007), it may also be important to consider the evidence that depression increases the likelihood of individuals participating in risk-taking behaviours (Allgower, Wardle, & Steptoe, 2001; Kandel, Raveis, & Davies, 1991; Shrier, Harris, Sternberg, & Beardslee, 2001), particularly for men (Allgower et al., 2001). Again, this is an area that requires further research.

Stereotypic, major, compulsive and impulsive self-injury

Simeon and Favazza (2001) also provided a classification system for explaining self-injury. This classification system is more detailed, taking into consideration the complexity and number of DSM-IV-TR (APA, 2000) diagnostic categories with which self-injury may fit. This also expands on earlier approaches for classifying SIB (e.g., Favazza & Rosenthal, 1990, 1993; Menninger, 1935; Ross & McKay, 1979; Walsh & Rosen, 1988). This classification system currently remains the one with which the majority of researchers are the most satisfied (Walsh, 2006).

The four categories of this classification system are as follows: Stereotypic, Major, Compulsive and Impulsive. *Stereotypic* SIB is used to refer to behaviours such as head banging, self-hitting, hand and face chewing, and hair pulling. These behaviours typically have organic sequelae and are common in individuals diagnosed with Intellectual Disabilities and Pervasive Developmental Disorders. Under this classification, SIBs are generally self-stimulatory in nature, where the pattern is often fixed and highly repetitive. Some of the other disorders of which Stereotypic SIB

may be a part include Tourette's Disorder, temporal lobe epilepsy, Lesch-Nyhan and Cornelia de Lange (Favazza, 1996; Walsh, 2006). Although Walsh (2006) speculated that Stereotypic SIB has more psychological content than commonly recognised, it generally is accepted that self-injury which accompanies a primary diagnosis of Intellectual Disability or Pervasive Developmental Disorder, such as Autism, should be considered a distinctly separate phenomenon. Subsequently, this type of self-injury is exempt from consideration in the current review.

Major SIB includes very severe and potentially life-threatening injuries such as castration, eye enucleation, and limb amputation. These behaviours generally represent a very isolated range of SIB and occur rarely. Typically, such an intrusive, violent act is engaged in when the individual is suffering from psychosis, intoxication or a severe psychiatric disorder. Self-injury that occurs when an individual is experiencing psychosis should be considered separately (APA, 2000; Favazza, 1996). This is because the person engages in self-injury while experiencing a profound disturbance in perception or thought, such as a hallucination or delusion and is unable to recognise the irrationality of his/her behaviour (Conn & Lion, 1983). Furthermore, in psychotic self-injury, the site of injury is almost always associated with a delusional belief (Clark, 1981). Despite this, there are reported instances where major self-injury has occurred without the presence of psychosis, such as in individuals who suffer from non-psychotic Body Dysmorphic Disorder (BDD) (Conejo, Moreno, Crespo, & Saiz, 2006; Favazza, 1996).

Compulsive SIB may involve repetitive hair-pulling (trichotillomania), skin picking (dermatillomania), and nail biting (onychophagia). Individuals who engage in these behaviours feel compelled to perform the act automatically, without any

conscious urge (Simeon & Favazza, 2001), but may wish to resist it with varying degrees of success (White Kress, 2003). Recent research has identified a small number of patients who engage in compulsive nail, finger and hand biting following cervical spinal cord injury (Couts & Gleason, 2006). The authors of that research suggested that there is evidence which indicates that these self-injurious behaviours reduce when these patients are administered anti-convulsant medication. Certainly, evidence has suggested that the aetiology of compulsive self-injury is neurochemical dysregulation (Haw, Hawton, Houston, & Townsend, 2001; Herpertz, 1995; Mathews et al., 2003; Robertson, Trimble, & Lees, 1988). In this way, compulsive self-injurious behaviours may be classified in a similar way to stereotypic movement disorders or Obsessive-Compulsive Disorder (OCD).

Impulsive SIB refers to the category of behaviours which are more prolific and have been researched more extensively. Impulsive SIBs consist of self-cutting, self-burning, and self-hitting that is of a mild to moderate severity (White Kress, 2003). These types of behaviours will be described in more detail later. There are reportedly two types of Impulsive SIB, episodic and repetitive (Favazza, 1996). The first type refers to self-injurious behaviours that occur only a limited number of times throughout an individual's life. Repetitive self-injurious behaviours, in contrast, perhaps are more common and have been the target of extensive research. Individuals who engage in repetitive, impulsive self-injury may be classified as suffering from an Impulse Control Disorder Not Otherwise Specified (Favazza & Simeon, 1995). It can be said that these are the types of behaviours that are generally what researchers are referring to when they report on NSSI or self-mutilation. The following section discusses the different types of NSSI behaviours in which

individuals commonly engage.

Types of self-injurious behaviours

Cutting

Approximately 75% of those who engage in NSSI use multiple methods (Conterio et al., 1998; Favazza & Conterio, 1989; Gratz, 2001; Herpertz, 1995). However, cutting consistently has remained the most common self-injurious behaviour, particularly in females (Feldman, 1988a; Fruensgaard & Flindt Hansen, 1988; Rodham et al., 2004; Klonsky, 2007; Ross & Heath, 2002; Ross & McKay, 1979). Self-cutting describes a range of behaviours which break the skin including carving (Rosenthal et al., 1972; Schwartz et al., 1989), scratching and skin puncturing or stabbing (Favazza, 1989; Ross & McKay, 1979) as well as cutting. Self-cutting may consist of a single laceration, however, multiple lacerations made in a single cutting episode are more common. The extent of the damage sustained may range from superficial cuts or scratches that heal easily without scars through to injuries that are greater in number and/or involve more severe tissue or nerve damage (Simpson, 1976).

Individuals may or may not use an implement to assist in breaking of the skin, although where implements are used, individuals may be quite resourceful in the selection of suitable tools. Razor blades generally are the most common tool used (Feldman, 1988a; Harris & Rai, 1976; Nock & Favazza, 2009; Novotny, 1972; Raine, 1982; Rosenthal et al., 1972; Schwartz et al., 1989; Takeuchi et al., 1986), however, individuals also have been known to use everything from shards of glass

(Novotny, 1972; Rosenthal et al., 1972; Schwartz et al., 1989, Simpson, 1976) to food bones (Feldman, 1988a), pen caps and credit cards (Conterio et al., 1998). These latter examples of resourcefulness are typically noted in settings such as psychiatric hospitals and prisons, where 'sharps' (i.e., razors, scissors and metal utensils) have been prohibited (Conterio et al., 1998).

Generally, the most common sites of the body where individuals will cut are the hands and arms, including wrists (Grunebaum & Klerman, 1967; Phillips & Akan, 1961), however, these have not been exclusive sites of injury (Feldman, 1988a; Gardner & Gardner, 1975; Lion & Conn, 1982; Novotony, 1972; Schwartz et al., 1989; Simpson, 1976). Individuals also are known to cut their legs (Feldman, 1988a; Novotony, 1972; Rosenthal et al., 1972; Takeuchi et al., 1986), feet (Feldman, 1988a), abdomen and stomach (Novotony, 1972; Rosenthal et al., 1972), face (Feldman, 1988a; Novotony, 1972; Raine, 1982; Rosenthal et al., 1972; Schwartz et al., 1989); neck (Novotony, 1972; Rosenthal et al., 1972; Schwartz et al., 1989) and chest (Feldman, 1988a; Muluka & Dhadphale, 1986; Rosenthal et al., 1972; Schwartz et al., 1989). Indeed, almost every part of the body has been subjected to self-cutting (Rosenthal et al., 1972; Ross & McKay, 1979; Simpson, 1976; Takechi et al., 1986), and the individual who engages in self-cutting is only limited by his or her own dexterity (Ross & McKay, 1979).

Burning

Burning the skin is another reportedly common method of self-injury (Favazza, 1989; Favazza, 1996; Fruensgaard & Flindt Hansen, 1988; Matsumoto et al., 2005; Rosenthal et al., 1972; Ross & McKay, 1979; Schwartz et al., 1989;

Selekman, 2009). However, there has been very little research conducted on this particular type of behaviour in the context of NSSI. As with self-cutting, most areas of the body have been subjected to injury from self-burning (Ross & McKay, 1979). However, self-immolation of one's entire body is rare (Haines et al., 1998; O'Sullivan & Kelleher, 1989; Ross & McKay, 1979) and some researchers have suggested that individuals who engage in NSSI and those who engage in suicidal self-immolation seem to be fairly distinct groups (Laloe, 2003).

Burning the skin directly with a lit cigarette, lighters or matches is a common phenomenon (Matsumoto et al., 2005; Raine, 1982; Rosenthal et al., 1972; Selekman, 2009), as is using a lighter or matches to heat objects such as needles, utensils or hair pins which are then applied to the skin (Favazza, 1996). Pouring corrosive or flammable liquid over the skin (e.g., lighter fluid) also can be considered methods of self-burning, as can rubbing objects on the skin to creating a friction burn (Selekman, 2009). Self-burning appears to be common among adolescents and residents of juvenile correction centres (Matsumoto et al., 2005), particularly among male inmates (Claes et al., 2007). Other reported methods of self-burning include sitting on a hot radiator, pressing the skin to an iron or hotplate, electric shock, drinking boiling liquid, and applying caustic substances and nitric acid (Ross & McKay, 1979; Tantam & Whittaker, 1992). Often the individual may desire to create a specific pattern or symbolic mark with the scar left by the burn (Selekman, 2009; Walsh & Rosen, 1988).

In general, research has indicated that skin-burning is often performed quickly and impulsively (Ross & McKay, 1979). Recent research specifically examining the psychological factors associated with this method of self-injury is

sparse, however, it is known that the majority of people who self-burn also engage in self-cutting (Schwartz et al., 1989). Some researchers have suggested that people progress from cutting to burning when their cutting no longer achieves the desired outcome. For example, they may require stronger pain or a more severe method of injury to provide the same feelings of relief (Conterio et al., 1998). On the other hand, however, a more recent study comparing self-cutting with self-burning suggested that for people who self-burn, this behaviour may have limited clinical implications compared with self-cutting due to the fact that individuals who purely self-burn may actually demonstrate less psychopathology than individuals who engage in self-cutting (Matsumoto et al., 2005).

Abrasion, skin-picking and wound excoriation

Abrasive wounds to the skin are achieved by rubbing or dragging parts of the body against solid objects or other parts of the body (Fruensgaard & Flindt Hansen, 1988). As noted earlier, individuals who do not have access to instruments for engaging in cutting or burning still have the capacity to inflict injury to themselves. Individuals have used abrasive surfaces such as a brick wall rubbed against the skin (Rosenthal et al., 1972; Tantam & Whittaker, 1992), or they may irritate the skin using their mouth (licking, sucking etc.) to create or maintain open wounds (Ross & McKay, 1979).

Skin-picking and wound excoriation also are common among individuals who engage in other forms of self-injury (Favazza & Simeon, 1995). These behaviours can range from picking at scabs through to more serious injuries such as pulling out stitches and re-fracturing limbs (Kent & Drummond, 1989; Rosenthal et

al., 1972). Some individuals also have been noted to engage in behaviours that are designed to cause infection to wounds such as rubbing in dirt or other substances including one's own urine or faeces (Conterio et al., 1998).

Abrasive injuries can be severe and quite damaging, although these methods of self-injury are rarely reported in the literature (Gupta, Gupta, & Haberman, 1987). As a result, it is not known whether individuals who engage in these behaviours achieve the same response (e.g., relief) as generated by cutting or burning.

Self-hitting

In a frequently cited study by Favazza and Conterio (1989), self-hitting was the third most common self-injurious behaviour in females who habitually engaged in NSSI, with 30% identifying that they engaged in self-hitting. However, very little research attention has been given to this behaviour, particularly in the context of NSSI. Rather, the research is typically limited to the consideration of the behaviour of individuals with disabilities (e.g., Rollings, Baumeister, & Baumeister, 1977).

During an incident of self-hitting, individuals have hit parts of their body against solid objects (e.g., head banging against a wall, punching windows), hit themselves with solid objects (e.g., using a hammer), or have engaged in self-kicking, punching or slapping to induce injury (Andover et al., 2010; Langbehn & Pfohl, 1993; Tantam & Whittaker, 1992). It has been suggested that the nature of injury caused by self-hitting is different from that inflicted by other forms of self-injury such as cutting or burning. This is because the injuries inflicted may not be as apparent or as objectionable to others (Ross & McKay, 1979). However, this clearly is not always the case as punching and breaking a window, for example, often results

in significant damage to the hands by producing lacerations and causing bleeding (McKerracher, Loughnane, & Watson, 1968). Again, it is not known whether these types of injuries serve the same purpose for the individual as cutting or burning.

Individuals also have engaged in self-hitting to the extent that bones have been broken (Feldman, 1988a). However, not all forms of self-hitting are carried out with the intention of breaking bones. In Favazza and Conterio's 1989 study, bone breaking was listed as a form of self-injury separate to self-hitting, with 8% of individuals identifying that they engaged in this behaviour.

There also have been reports of individuals injuring themselves by failing to protect their body when falling (Tantam & Whittaker, 1992), or deliberately choosing to jump from a height where the fall was more likely to result in injury rather than death (Ross & McKay, 1979). There is some evidence to suggest that at least some individuals who engage in NSSI, primarily adolescent males, may also engage in risky stunts or dares involving self-injury (Roth, 2006). Cases of self-choking in the absence of suicidal or autoerotic intent also have been described (Colon, Popkin, & Carlson, 1989).

Self-biting including onychophagia

Self-inflicted injuries from biting one's lips, tongue and inside of the mouth have been noted. In addition, individuals also have caused damage to their arms, hands and fingers by self-biting (Ross & McKay, 1979). This behaviour can be difficult to classify because it rarely has been researched outside of specific populations (e.g., intellectual disability, cervical spinal cord injury or neurological disorders).

Nail biting (onychophagia) is a common form of self-biting (Azrin & Nunn, 1973; Cavaggioni & Romano, 2003; Silber & Haynes, 1992), however, it is important to appropriately classify this behaviour, as it is not always self-injurious (Walsh & Rosen, 1988). Only severe nail biting from which blood is drawn, resulting in significant cuticle and tissue damage, rather than the milder form, should be considered self-injurious in the same context as self-cutting and self-burning (Wells, Haines, Williams, & Brain, 1999).

Rarer forms of self-injury

Rarer forms of self-injury include the insertion or ingestion of foreign objects (Favazza, 1996; Ross & McKay, 1979; van Moffaert, 1990; Walter, 1991), amputation (Couts & Gleason, 2006; Favazza, 1989; Lion & Conn, 1982; Ross & McKay, 1979), genital self-mutilation (Bhatia & Arora, 2001; Favazza, 1989; Feldman, 1988a, 1988b; Hemphill, 1951; Schweitzer, 1990), and ocular self-mutilation (Eisenhauer, 1985; Feldman, 1988a; MacLean & Robertson, 1976; Rogers & Pullen, 1987; Shore, 1979). These behaviours are broad ranging in terms of severity and, most likely, motivation.

In the majority of the psychological and psychiatric literature citing rarer forms of self-injury, the motivation behind the behaviour is thought to be different from that of more common and superficial SIB. For example, whereas most acts of NSSI are considered impulsive (Favazza, 1992; Favazza & Simeon, 1995), insertion of foreign objects under the skin (self-embedding, Sharples, 2008) with needles, pins, paperclips and similar objects is reportedly a behaviour that is carefully planned and slowly executed (Ross & McKay, 1979). However, this method of NSSI may be

increasing among children and adolescents (Sharples, 2008).

Additionally, the majority of individuals who engage in amputation or other serious forms of self-injury were reported to be experiencing psychotic thinking at the time, or were diagnosed with Schizophrenia (e.g., Abraham & Alao, 2005; Tsai, 1997). However, this is not a necessary condition for amputation to occur. Cases of individuals experiencing drug abuse and or severe trauma without the presence of psychosis who have engaged in amputation also have been documented (Coons, Ascher-Svanum, & Bellis, 1986).

Physical self-alteration on a continuum

As noted earlier, the severity of bodily damage produced by self-injury may vary from mild 'nicks' that produce minimal bleeding to severe lacerations which damage nerves and tendons (Favazza & Conterio, 1989; Harris & Rai, 1976; Raine, 1982; Rosenthal et al., 1972; Takeuchi et al., 1986). However, the majority of self-injurious behaviour is associated with very little risk of death (Favazza, 1989; Ross & McKay, 1979; Simpson, 1976).

An alternative approach to the classification of SIB was established with these issues in mind (Walsh & Rosen, 1988). This classification system attempts to distinguish which behaviours should be considered self-injurious according to the related dimensions of (a) the severity of physical damage inflicted, (b) psychological state at the time of the act, and (c) social acceptability of the behaviour. Consideration of self-injury in terms of a behavioural continuum may aid the understanding of the specific dimensions that contribute to the classification of behaviour as dysfunctional (Walsh & Rosen, 1988). This continuum is presented in

Table 1.

Table 1

Self-alteration of physical form: A continuum.

Type	**Examples of behaviour**	**Degree of physical damage**	**Psychological state**	**Social acceptability**
I	Ear piercing, nail biting, small or professionally applied tattoos	Superficial to mild	Benign	Acceptable in all or most social groups
II	Punk rock piercings; saber scars among 19th century Prussian students: ritualistic scarring among Polynesian and African clans: large tattoos among sailors, motor-cycle gangs	Mild to moderate	Benign to agitated	Acceptable only within a specific subculture
III	Wrist and body cutting, self-inflicted cigarette burns, self-inflicted tattoos, wound excoriation	Mild to moderate	Psychic crisis	Generally unacceptable in all social groups; may be acceptable with a few like-minded peers.
IV	Autocastration, self-enucleation: amputation	Severe	Psychotic decompensation	Entirely unacceptable with all peers and in all social groups

(Walsh & Rosen, 1988, p.7)

Walsh and Rosen (1988) argued that Types I and II should not be considered self-injurious behaviours. Type II behaviours involve more severe self-injury than ear piercing and nail biting, however both Type I and II behaviours are considered symbolically meaningful or beauty enhancing (Walsh & Rosen, 1988) both by the individual and by an influential social group (Walsh, 2006). Walsh further reported the tendency towards a shift in widespread acceptance of body modification in the

last 30 years. In the 1980s Walsh shared images of various forms of body modification (e.g., tattoos and body piercing) with a professional audience and 80-90% of individuals indicated that they would classify these behaviours as self-injurious. In the mid 2000s, a similar audience responded to the images with only 5-10% of individuals indicating that they thought the behaviours were self-injurious (Walsh, 2006). Clearly, this would indicate a shift in society's view of body modification as a socially acceptable practice.

Only Type III and IV behaviours are considered self-injurious using this classification system (Walsh & Rosen, 1988). Although Type IV is categorised as self-injurious it involves severe self-injury, typically occurring as the result of psychotic thinking. Type III describes a common behaviour, and unlike other forms of self-injury, pertains to low lethality, socially unacceptable self-injury which the individual engages in due to psychological distress (Walsh & Rosen, 1988). Type III behaviours are the focus of the current investigation.

Summary

The review of self-injurious behaviours considered in this chapter is by no means exhaustive. A variety of behaviours have been incorporated under the term nonsuicidal self-injury, however, self-cutting remains the most common. Research has indicated that individuals may engage in a combination of behaviours during the period of time in which they engage in NSSI, and that the site of injury or instruments used also may change. However, there are other individuals who engage in the same pattern of self-injurious behaviour throughout their lives.

The severity of injury inflicted through NSSI may be mild, moderate or

severe. In general, the degree of injury appears to be unrelated to the type of NSSI, although it should be acknowledged that some behaviours, such as self-burning, are more difficult to control in terms of the physical bodily damage they cause. Researchers often have struggled to agree on an appropriate classification system for NSSI. One of the problems with this perhaps lies in the fact that attitudes towards different practises of body modification have changed throughout the last few decades. It is important to make a clear distinction between behaviours that are culturally sanctioned or taboo, but are of low clinical relevance from an affect regulation perspective, and those behaviours which are clearly serving some psychological purpose.

Having considered the ways in which NSSI can be classified in terms of different behaviours, the next chapter will discuss the way in which NSSI is classified in DSM-IV-TR (APA, 2000). Borderline Personality Disorder (BPD) is the only psychiatric condition which includes NSSI as a diagnostic criterion, yet not all individuals who engage in NSSI have BPD (Haines, Williams, & Brain, 1995). This chapter will discuss the history of BPD and current understanding of NSSI as a diagnostic criterion within this diagnosis.

CHAPTER 3

Borderline Personality Disorder

Borderline Personality Disorder (BPD) is an Axis II disorder which falls under the 'dramatic' Cluster B personality disorders in the DSM-IV-TR (APA, 2000). It is an extremely complex and serious disorder characterised by a high prevalence of suicide attempts and NSSI (Chapman, Derbidge, Cooney, Hong, & Linehan, 2009). Symptoms of BPD are broad and include a wide range of behaviours, however, individuals with BPD characteristically experience turbulent interpersonal relationships, marked impulsivity, impaired self-image, and recurrent unstable affect (APA, 2000).

Compared to other personality disorders, BPD is frequently described as less stable both in symptom presentation and course of the disorder (Benazzi, 2008). Like other personality disorders, an accurate diagnosis of BPD can only be made in adults, although there is debate in the literature regarding the possibility of identifying the disorder in adolescents (Bernstein, Cohen, Skodol, Bezirganian, & Brook, 1996) or even children (e.g., Robson 1983). Recently, the research has been interested in the ways in which early detection of BPD may improve assessment and treatment outcomes for those individuals with the disorder (Chanen et al., 2007; Rathus & Miller, 2002). This is certainly something which future research may wish to explore, however, DSM-IV-TR (APA, 2000) states that "adolescents and young adults with identity problems (especially when accompanied by substance use) may transiently display behaviours that misleadingly give the impression of Borderline Personality Disorder" (p. 708). Hence, one needs to apply caution when generalising findings from adult populations with BPD to adolescents.

The current DSM-IV-TR (APA, 2000, p.710) classification for BPD includes 9 criteria, 5 of which must be met in order to accurately make a diagnosis. The 9

criteria listed are:

1. *Frantic efforts to avoid real or imagined abandonment. Note: Do not include suicidal or self-mutilating behaviour covered in (5).*
2. *A pattern of unstable and intense interpersonal relationships characterized by alternating between extremes of idealization and devaluation. This is called "splitting."*
3. *Identity disturbance: markedly and persistently unstable self-image or sense of self.*
4. *Impulsivity in at least two areas that are potentially self-damaging (e.g., spending, sex, substance abuse, reckless driving, binge eating). Note: Do not include suicidal or self-mutilating behaviour covered in (5).*
5. *Recurrent suicidal behaviour, gestures, or threats, or self-mutilating behaviour.*
6. *Affective instability due to a marked reactivity of mood (e.g., intense episodic dysphoria, irritability, or anxiety usually lasting a few hours and only rarely more than a few days).*
7. *Chronic feelings of emptiness.*
8. *Inappropriate, intense anger or difficulty controlling anger (e.g., frequent displays of temper, constant anger, recurrent physical fights).*
9. *Transient, stress-related paranoid ideation or severe dissociative symptoms.*

There is a great deal of variation in the prevalence rates given for BPD, but estimations remain at 1 to 2% for the general population (Lenzenweger, Lane,

Loranger, & Kessler, 2007; Paris, 1999; Torgersen, Kringlen, & Cramer, 2001), 11% of all psychiatric outpatients (Heard & Linehan, 1993) and up to 25% of all psychiatric inpatients (Baker, Silk, Westen, Nigg, & Lohr, 1992; Widiger & Weissman, 1991). Recent studies by Jackson and Burgess (2000) suggested that approximately 6.5% of the adult Australian population have one or more personality disorders. BPD is by far the most commonly diagnosed personality disorder (Gunderson, 1984; Widiger & Weissman, 1991) and the most researched (Zimmerman & Mattia, 1999). BPD is a disorder that is more commonly diagnosed in young women (Becker, 1997; Swartz, Blazer, George, & Winfield, 1990).

There has been growing interest in so-called juvenile BPD, such that there has even been a special edition of Development and Psychopathology devoted to the topic (Lenzenweger & Cicchetti, 2005). The problem with this assumption is that, by definition, personality disorders are supposed to be enduring, lifelong conditions (APA, 2000) and this cannot be established in a very young person. However, it is perhaps an accurate assumption that symptoms manifest most strongly during early adulthood given hormonal shifts and developmental challenges associated with this age group (Paris, 2005; Zanarini, Frankenburg, Khera, & Bleichmar, 2001).

The development of the conceptualisation of BPD

BPD remains a much debated diagnosis in the research literature. Much of the controversy surrounds issues such as the variability and number of symptoms in comparison with other DSM-IV-TR (APA, 2000) diagnoses (Asnaani, Chelminski, Young, & Zimmerman, 2007), issues with comorbidity and difficulty with diagnosis (Lieb et al. 2004), the appropriateness or meaningfulness of the name of the disorder

(Classen, Pain, Field, & Woods, 2006; Davis, Blashfield, & McElroy, 1993), and if BPD as a psychiatric condition even exists (e.g., Charland, 2007).

BPD was not formally included in the DSM until 1980 (DSM-III; APA, 1980), although research evidence has suggested that early conceptualisations of the disorder date back to Greek Scholars. For example, descriptions of conditions characterised by marked impulsivity and mood lability are noted in the works of Aretaeus, Hippocrates and Homer (Millon & Davis, 1996). Such observations are absent in Medieval documentation, however, they resurfaced in the 17th century with Bonet's reference to *folie maniac-melancholique* which described a syndrome characterised by impulsivity and emotional lability (Millon, 1992). Millon (1992) described reports from 1854 from Baillarger and Falret detailing their findings from 30 years of work with depressed and suicidal patients. These authors described a large group of patients whose symptoms waned from depression to intermittent episodes of anger, irritability, and elation to periods of normality. In 1890, Falret's son and later Janet (1901) expanded on this description to include observations of patients who were emotionally volatile, impulsive, and prone to contradictions in their behaviour (Millon, 1992). The 19th century nosologist Kraepelin was one of the first theorists to refer more specifically to conditions affecting personality, and his observations of impulsivity, unstable relationships, anger, affective instability and self-destructiveness more closely reflect current conceptualisations of BPD (Millon, 1992).

More contemporary references to the term 'Borderline' can be attributed to Stern (1938) who described a group of patients whose behaviour could be classified as being on the 'borderline' between psychosis and neurosis. Terms such as

'borderland insanity' or 'borderline insanity' also were used by physicians around this time to describe a group of patients whose mental state appeared to fluctuate between 'reason' and 'despair' (Millon & Davis, 1996). During this time, emphasis was placed on the presence or absence of psychosis and patients with 'borderline' features or behaviours were vaguely conceptualised within the spectrum of Schizophrenia. A characterisation of the 'borderline' entity distinct from Schizophrenia was expanded upon by Zilboorg (1941) and Hoch and Polatin (1949) but was not included in the first published version of the DSM (APA, 1952). During the 1950s and 1960s interest in borderline phenomena re-emerged, as researchers conceptualised the disorder within more of a psychoanalytic framework, thinking of symptoms in terms of an affective disorder spectrum. Easser and Lesser (1965) formulated a 'hysteroid' borderline type which was something akin to histrionic personality, but recognised as more severe (Millon, 1992).

Grinker, Werble, and Drye (1968) published a landmark study in the area of BPD research in which they outlined groups of patients whose symptoms and behaviours were grouped on the basis of a factor analysis. The first group was referred to as the 'psychotic border' group whose behaviour was erratic, angry and depressed, and who demonstrated a clinically inappropriate level of negative behaviour towards others. The second group, referred to as the 'core borderline syndrome' was characterised by pervasive negative affect, demonstrated by 'acting out'. This group also was described as depressed, angry and lacking in indications of a stable sense of identity. The third group, referred to as the 'affectless' group, described a group of patients who were anhedonic, withdrawn, lacking in a sense of identity and unable to form appropriate attachments to others. The fourth group,

referred to as the "border with the neuroses" group, demonstrated childlike "clinging" behaviour, depression, anxiety and neurotic behaviour (p. 89). To summarise their findings, the authors stated that Borderline individuals were characterised by the following: (1) anger; (2) defective relationships; (3) absence of consistent identity; and (4) depression and loneliness due to interpersonal difficulties.

It was not until the 1970s that the 'borderline syndrome' (Kernberg, 1976) was more clearly defined as an affective disorder rather than as a variant or subtype of Schizophrenia. Kernberg (1976) used the term borderline to describe serious forms of character pathology, and this is generally accepted as the first modern conceptualisation of BPD. An extension of this concept is reflected in the work of Gunderson and Singer (1975) who provided a review which proposed six criteria for the diagnosis of BPD. Specific criteria for the diagnosis of BPD were outlined by Robins and Guze (1970), and then extended by Spitzer, Endicott, and Gibbon (1979) who further delineated a set of criteria that more closely resembles that of the current diagnostic criteria. Spitzer et al. comprised a list of 17 criteria which was reviewed by 4,000 psychiatrists. The discriminatory capacity of these criteria indicated that the list could accurately discriminate individuals with and without BPD individuals approximately 90% of the time. The second major conceptualisation of BPD is reflected in the work of Gunderson (1984) who used the term borderline to describe a specific personality disorder. Gunderson proposed that this disorder could be meaningfully distinguished from a number of other Axis II disorders in Cluster A (odd) and Cluster C (anxious).

In the 1960s and 1970s, research focused on the conceptualisation of borderline individuals as having a propensity to experience transient psychotic-like

symptoms. Researchers proposed that BPD was better explained as a schizophrenia spectrum disorder (Wender, 1977). When the disorder was first included in the third edition of the DSM, there were only 8 diagnostic criteria. Criterion 9, 'transient, stress-related paranoid ideation or severe dissociative symptoms', was not added until 1987 (DSM-III-R, APA, 1987).

The fourth conceptualisation appeared during the 1980s and this reflected a more thorough approach by combining aspects of clinical care with empirical research. This approach focused on the chronic dysphoria and affective instability of individuals with BPD. Within this conceptualisation, several researchers took the view that BPD was better explained as an affective spectrum disorder (e.g., Akiskal, 1981; Stone, 1980).

The fifth and sixth conceptualisations of BPD were developed during the 1990s. Several researchers proposed that BPD is best conceptualised as an impulse spectrum disorder, which is related to substance use, Antisocial Personality Disorder (ASPD), and possibly eating disorders (Links, Heslegrave, & van Reekum, 1999; Zanarini, 1993).

Another view that was first proposed by Herman and van der Kolk (1987) suggested that BPD can be conceptualised as a chronic form of PTSD. This led to the suggestion that BPD may be a trauma spectrum disorder, which is closely related to dissociative disorders. However, several researchers have disagreed with this conceptualisation, highlighting that there are nontraumatic pathways to BPD (Graybar & Boutilier, 2002; Paris & Zweig-Frank, 1992) and stating that it is unwise to view childhood adversity as the cause of BPD (Zanarini & Frankenburg, 2007).

More recently, the research has seen a rise in the view that BPD is more

accurately understood as a mood disorder, particularly within the context of Bipolar Disorder (BP, or sometimes confusingly referred to in the literature as BPD). Numerous papers have been dedicated to the topic of whether or not BP and BPD can be meaningfully differentiated, and whether or not these two disorders should be conceptualised within the same spectrum (e.g., Benazzi, 2008; Gunderson et al., 2006; Magill, 2004; Paris, Gunderson, & Weinberg, 2007; Wilson et al., 2007).

There are an alarming number of clinicians who either mistakenly view the emotional lability of BPD individuals as symptoms of BP (Paris, 2008; Zanarini & Frankenburg, 2007), or are choosing not to use BPD diagnoses for insurance reasons, or fear of stigma and poor outcome for their patients (Paris, 2008). The relationship between BPD and BP and potential issues with comorbidity will be discussed in more detail in Chapter 8.

BPD has remained a valid diagnosis in subsequent versions of the DSM (APA, 1994, 2000) and also is included in the International Classification of Disease (ICD-10) (World Health Organisation, WHO, 1993) system. Research has indicated that BPD has a unique clinical presentation that successfully can be differentiated from other disorders (Zanarini, Gunderson, Frankenburg, & Chauncey, 1990). It has been established that BPD likely has both a biological and environmental aetiology (Torgersen et al., 2001; Zanarini, Frankenburg, & Frances, 1997).

Criticisms of the use of BPD diagnosis

Despite the fact that BPD has been considered to be a sufficiently reliable and valid diagnosis by the International Personality Disorder Examination (IPDE; Loranger, Sartorius, Andreoli, & Berger, 1994), there have been examples where

researchers have questioned whether or not BPD actually exists, or they have emphasised that the term reflects a dated or unhelpful diagnosis (e.g., Herman, Perry, & van der Kolk, 1989). Charland (2007) pointed out that within the Chinese Classification of Mental Disorders (CCMD-III, in Charland, 2007) there is no mention of BPD or allusion to its existence. The reasons for this absence of a BPD diagnosis appear to be related to cultural concerns with medicalisation of behaviour and avoiding stigma. However, it is apparent that even though BPD does not 'officially exist' in China, there certainly are individuals in China with BPD (Zhong & Leung 2007 in Charland, 2007).

Over time, the term 'borderline' has been used as something of a miscellaneous category to define those patients that clinicians do not know how to diagnose (Kreisman & Straus, 2004), or to describe individuals who demonstrate challenging behaviour (Markham & Trower, 2003). Certainly, there is indication that BPD has been over diagnosed or inappropriately diagnosed (Winstead & Sanchez-Hucles, 2008). Kreisman and Straus (2004) provided the following description, which defines how many researchers and clinicians view this disorder:

"*In many ways, the borderline syndrome has been to psychiatry what the virus is to general medicine: an inexact term for a vague but pernicious illness that is frustrating to treat, difficult to define, and impossible for the doctor to explain adequately to his [sic] patient*" (p.5).

Researchers such as Classen and colleagues (2006) suggested that the problems associated with the diagnosis of BPD stem from the time it took for the first mention of the disorder in 1938 (Stern, 1938) to inclusion in the DSM-III in 1980. The validity of the BPD diagnosis has long been questioned (Paris, 1994) for

being vague and stigmatizing, particularly towards women (Courtois, 2004; Zanarini et al., 1997).

Furthermore, there has been the suggestion that a diagnosis of BPD does not fully acknowledge the influence of environmental factors which contribute to maladaptive behaviour such as childhood abuse and attachment problems. One author has suggested that a dual diagnosis of PTSD and BPD is insufficient and that the conceptualisation of BPD should be changed to better accommodate trauma, abuse and dysfunctional parental attachment experiences of these individuals (Classen et al., 2006). Rates of comorbid PTSD in this group are high, with 56% of individuals with BPD also experiencing comorbid PTSD and 68% of individuals with PTSD also receiving a diagnosis of BPD (Shea, Zlotnick, & Weisberg, 1999). However, despite these suggestions that the diagnosis of BPD should encapsulate more of these contributing factors, it needs to be maintained that the DSM-IV-TR (APA, 2000) is designed to be atheoretical in its classification of psychiatric disorders (Bender & Skodol, 2007).

For these reasons, some researchers have proposed to change the name of the disorder to reflect additional experience of trauma. Posttraumatic Personality Disorder and Complex Posttraumatic Stress Disorder (Classen et al., 2006) are two alternatives that have been proposed. Although these proposals clearly recognise some important aspects of BPD that may otherwise be missing, they do not account for the fact that not all individuals with BPD have experienced similar levels of trauma and/or attachment problems. There is research to suggest that despite popular belief, not all individuals diagnosed with BPD come from dysfunctional family backgrounds and, similarly, not all individuals have experienced trauma and abuse

(Gunderson & Sabo, 1993; Paris, 2008). The relationship between BPD functioning and PTSD will be explored further in Chapter 8.

Other researchers have suggested that BPD should be renamed Emotion Regulation Disorder or Emotion Dysregulation Disorder (e.g., Pfohl, 1999). It has recognised for some time that the term 'Borderline Personality Disorder' is vague and means little to laypeople who are trying to understand this complex disorder (Paris, 2008). It has been suggested that difficulties in the regulation, expression and management of emotions is at the core of BPD (Pfohl, 1999), hence a change of name would better account for and explain the diagnosis (Pfohl, 1999). Despite these concerns, the name of the disorder will remain unchanged in DSM-V, on the grounds that (a) changing the name will not reduce stigma, and (b) the names of other disorders such as Anorexia Nervosa (AN) and Schizophrenia also are inaccurate ways of describing psychopathology, yet remain unchanged (Skodol, 2011). The role of emotion regulation in BPD will be discussed further here and in Chapter 4.

Theories regarding BPD

There is perhaps no single theory with which to adequately explain the aetiology of BPD. Like many other psychological phenomena, the debate about whether the development of BPD is more accurately attributed to environmental or biological influences is ongoing (Paris, 2008). Early conceptualisations of BPD stem from psychoanalytic theory. Traditionally, this theory stresses that BPD symptoms result when the mother has failed to provide appropriate nurturance, tending to respond to her child in an unpredictable way (Stern, 1938). As a result of this poor nurturing, the child responds with aggression and may have difficulty synthesising

conflicting positive and negative emotions, which results in 'splitting' (Kernberg, 1976). In addition, some researchers have suggested that failures in early mothering lead to a failure to develop stable object constancy (Adler & Buie, 1979). It is also within psychoanalytic theory that Masterson (1972) first suggested that fear of abandonment is a central feature in BPD.

Traditional psychoanalytic treatment focuses on the resolution of unconscious conflicts that the individual with BPD experiences, sometimes through the use of transference in a therapeutic relationship (Stern, 1938). In more modern times, psychoanalytic approaches have become less popular after widespread criticism that this approach ignores the important influences of biology, social learning and cognition (Westen, 1991).

Environmental theories of BPD share some similar concepts of psychoanalytic theory in that the role of early life experiences, particularly the influence of trauma, is viewed as critical. In particular, five environmental factors are believed to be of aetiological importance: (1) early separation and loss, (2) disturbed parental involvement, (3) experiences of verbal and emotional abuse, (4) experiences of physical and sexual abuse, and (5) experiences of physical and emotional neglect (Zanarini & Frankenburg, 2007). These factors derive from years of clinical observations that many patients with BPD reported a history of abuse.

Some researchers have claimed that the experience of early trauma is a causal factor in the development of BPD (e.g., Bleiberg, 1994; Brown & Anderson, 1991; Bryer, Nelson, Miller, & Krol, 1987; Herman et al., 1989; Ogata et al., 1990; Silk, Lee, Hill, & Lohr, 1995). However, other researchers have argued that this view represents an oversimplification and that meta analyses indicate that the relationship

between these factors is weak (e.g., Fossati, Madeddu, & Maffei, 1999; Paris, 2003). It appears that although trauma may be a risk factor for BPD, it is not the primary cause, as research has indicated that there are several non traumatic pathways to the development of BPD (e.g., Graybar & Boutilier, 2002, Paris & Zweig-Frank, 1992). Approximately one third of individuals with BPD report an absence of childhood trauma (Paris, 2007), and another third report isolated incidents with little clinical significance (Paris & Zweig-Frank, 1996). It certainly is the case that not all individuals who experience childhood abuse and trauma develop BPD, just as it is not true to state that all individuals with BPD report a history of abuse.

Similar to these environmental theories are the attachment theories of BPD. Some researchers have suggested that there is a direct causal link in disturbed parental attachment between nascent BPD children and their parents. A range of studies have investigated the role of parental bonding or attachment (e.g., Barone, 2003; Hooley & Hoffman, 1999; Nickell, Waudby, & Trull, 2002; Patrick, Hobson, Castle, Howard, & Maughan, 1994; West, Keller, Links, & Patrick, 1993) and found that individuals with BPD report pathological attachments. Specifically, a number of studies have found that individuals with BPD are more likely to demonstrate anxious or ambivalent attachment styles (e.g., Nickell et al., 2002; West et al., 1993).

It has not been determined whether or not this relationship is accurately explained in terms of poor attachment and neglect leading to the development of BPD (e.g., Adler, 1985; Bradley & Westen, 2005; Fonagy, Target, & Gergely, 2000; Levy, 2005). Certainly, there has been a tendency to blame poor parenting as the cause of BPD (e.g., Bateman & Fonagy, 2006; Kernberg, 1976). For example, some research has suggested that individuals with BPD were more likely to report having

mothers who were cold and emotionally unresponsive (Zanarini, Williams, Lewis, & Reich, 1997). However, other researchers have suggested that as children, individuals with BPD are more likely to have mothers who are dramatic, overly protective (Patrick et al., 1994; Torgersen & Alnaes, 1992) and emotionally over involved in their children's lives (Hooley & Hoffman, 1999).

However, Paris (2003, 2008) pointed out that children may fail to develop secure attachments *because* they have BPD and, therefore, their retrospective accounts of their childhoods are likely biased towards a negative outlook. This means that the validity of these findings depends on the accuracy of reporting from individuals who are currently mentally ill, and factors such as negative childhood are related to the development of a range of disorders, not just BPD (Rutter, 1989).

The application of behavioural based theories in the development of BPD is relatively new. Proponents of a social learning perspective (Millon, 1981) have argued that BPD results from a fundamental difficulty in the absence of a consistent sense of personal identity. This then contributes to the development of inconsistent, impulsive behaviours that impact on the individual's inability to achieve satisfactory outcomes. In this way, individuals with BPD learn to become dependent on others for a sense of identity, yet experience intense conflicts about their dependency and autonomy. This then provides the basis for interpersonal deficits that are characteristic of BPD.

From a Cognitive Behavioural Theory perspective, Beck and Freeman (1990) suggested that there are three fundamental cognitive appraisals that are characteristic in individuals with BPD: the belief that the world is dangerous and malevolent, that the individual with BPD is powerless and vulnerable, and that the individual with

BPD is inherently unacceptable. This theory also emphasises the role of dichotomous thinking and identity disturbance which make it difficult for the individual to feel self-efficacious.

A biological explanation of BPD that incorporates genetics and neurological components is becoming a more popular approach. These approaches may be referred to as neurobiological, neurobehavioural, or psychobiological approaches (e.g., Kimble, Oepen, Weinberg, & Williams, 1997; Marziali, 1992; New et al., 1997; New & Stanley, 2010; Siever & Davis, 1991; Soloff & Millward, 1983; Stanley & Siever, 2010; Stanley et al., 2010). Researchers such as Siever and Davis (1991) have argued that personality disorders have a core biological component that contributes directly to behavioural characteristics such as impulsivity, inhibition and affective instability. More recent research has been able to link NSSI with low levels of opioids in individuals with BPD (e.g., New & Stanley, 2010).

The evidence that BPD involves one or a number of influencing biological deficits is equivocal (Cowdry, 1992; Kimble et al., 1997; Marziali, 1992; Schore, 2003). This includes evidence from studies in genetics (e.g., Jang, Livesly, Vernon, & Jackson, 1996; Parker & Barrett, 2000), neurophysiological such as abnormal EEG activity (e.g., Cornelius, Soloff, George, & Schulz, 1989; Kutcher, Blackwood, & St Clair, 1987), and neuropsychological findings such as deficits in executive functioning and problem-solving (e.g., Bazanis et al., 2002; Burgess, 1990, 1991; Cornelius et al., 1989; Driessen et al., 2000).

It would appear that there currently is good evidence to support the view that BPD is a psychobiologically based disorder. It may be the case that this theory is the most capable perspective available to explain the multidimensional aspects of BPD

behaviour, including affective instability, impulsivity, and interpersonal difficulties. Nevertheless, a number of theorists currently favour a combined approach of biology and environmental factors. For example, Linehan's (1993) biosocial model posits that it is the combination of biological predisposition towards emotional vulnerability, and the experience of an invalidating environment that contributes to the development of BPD. An invalidating environment is one in which the child's perceptions, thoughts, sensations and interpretations are responded to in an inconsistent manner, leading the child to question or doubt his/her own judgments about these internal experiences and emotions (Crowell, Beauchaine, & Linehan, 2009; Linehan, 1993). Unlike psychoanalytic theory, this model places less emphasis on the exclusive role of the mother in the caregiver relationship.

The biosocial model of BPD (Crowell et al., 2009; Linehan, 1993) is considered by some to be the "current and central" theory of BPD (Glenn & Klonsky, 2009, p. 21). This theory focuses on the emotional difficulties experienced by individuals with BPD and suggests that these individuals adopt poor coping skills due to the influence of both a biological propensity towards heightened emotional reactivity and an invalidating environment. Essentially, this model reorganises DSM-IV-TR (APA, 2000) criteria into five domains. It proposes that individuals with BPD experience problems with emotional dysregulation in five domains: (1) emotions, (2) interpersonal relationships, (3) behaviour, (4) cognitive processing, and (5) sense of identity. Within this theory it is suggested that emotion in BPD is impaired in two possible ways: (1) that BPD individuals experience hyper-intensity and reactivity (i.e., emotions are triggered easily and reactions are more heightened than they are for other individuals) and (2) poor regulation of emotions (i.e., there is a deficit in the

control or modulation of emotional experiences). This second component is often referred to as emotion dysregulation.

Emotion dysregulation

Several of the DSM-IV-TR (APA, 2000) diagnostic criteria for BPD reflect abnormalities in emotional functioning (Glenn & Klonsky, 2010; Klonsky & Olino, 2008; Selby et al., 2010). Despite the lack of consensus among researchers as to the origins of BPD, the majority of these theories identify emotion dysregulation as being a core feature of the development and maintenance of the disorder (e.g., Conklin, Bradley, & Westen, 2006; Sanislow et al., 2002).

Affect regulation is considered to be an essential part of personality functioning and provides an explanation for individual differences in personality (Gross, 1999). Affect regulation involves the processes that individuals use to influence their emotional experiences in terms of when, where and how they experience and express emotions (Gross, 1998a).

Emotion dysregulation refers to deficits in the biological and behavioural processes involved in emotion regulation. Specifically, some researchers have suggested that emotion dysregulation refers to a pattern of acute sensitivity and responding to emotionally evocative stimuli across multiple contexts (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006; Gunderson, 2001; Linehan, 1993; Livesley, Jang & Vernon, 1998; Selby & Joiner, 2009; Skodol et al., 2002). Others have explained emotion dysregulation as the inability to control and modulate one's emotional state, such that one's emotions can become out of control and impair one's judgment and reason (Shedler & Westen, 2004).

Individuals who are recognised as suffering from emotion dysregulation may experience heightened intensity of emotions, strong sensitivity to emotional stimuli, poor understanding of emotions, greater negative reactivity to emotional stimuli with slow return to baseline following emotional arousal, and diminished capability for using self-soothing strategies to recover from unpleasant negative emotions (Ebner-Priemer et al., 2008; Mennin, Heimberg, Turk, & Fresco, 2005). Other researchers have suggested that individuals with BPD actually fear their emotions, viewing them as harmful and dangerous, and certain social and biological factors predispose these individuals to experiencing a phobic response to emotions (e.g., Linehan, 1993; Sauer & Baer, 2009).

Gross (1998b) explained that strong, unpleasant emotions may by particularly unwelcome because they compromise task performance or betray secret preferences. At such times, individuals will attempt to regulate their emotions in two very different ways. Gross's research found that reappraisals decrease expressive behaviour and subjective experience. Alternatively, individuals may inhibit emotion-expressive behaviour once the emotion is already underway. Emotional suppression appears to decrease expressive behaviour, but it does not affect subjective experiences, and, in fact, actually increases certain aspect of physiological responding. Gross further speculated that certain forms of antecedent-focussed emotion regulation (e.g., reappraisal) may be better for individuals' health than response-focused forms of emotion regulation such as suppression.

The research into NSSI indicates that individuals who engage in the behaviour may have strong needs for experiential avoidance (escaping or avoiding unwanted emotions, sensations and experiences; Chapman et al., 2009; Hayes et al.,

2004). This is particularly true during situations in which the individual has little control (e.g., Chapman et al., 2006). Individuals with BPD in particular are likely to engage in experiential avoidance (Chapman et al., 2009; Hayes et al., 2004), which has important implications for explaining why these individuals engage in impulsive and potentially harmful behaviours.

Several researchers (e.g., Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2009; Gunderson, 2001; Linehan, 1993; Livesley et al., 1998; Selby & Joiner, 2009; Skodol et al., 2002) have proposed the theory that BPD is essentially a disorder of pervasive emotion dysregulation, which is influenced by early childhood experiences (Meares, Stevenson, & Gordon, 1999; Taylor, Bagby, & Parker, 1997) and psychobiological abnormalities, particularly in the amygdala and frontal lobe (e.g., Donegan et al., 2003; Schmahl & Bremner, 2006). There are different explanations as to the ways in which emotions play a role in the development and maintenance of BPD. Some researchers have suggested that BPD causes individuals to be hypersensitive to emotional stimuli and experience an excess in emotional responding (e.g., Domes et al., 2008; Wagner & Linehan, 1999), whereas others have claimed that it is a lack of emotional experience, and poor understanding of others' emotional experiences that contributes to symptoms (e.g. Fertuck et al., 2009; Noy, 1982).

Emotion dysregulation in BPD and its role on the interpretation of one's own and others' emotions

There is a wealth of evidence that suggests that affective dysregulation in BPD is characterised by the intensity of negative emotions, rather than positive ones (Conklin et al., 2006; Ebner-Priemer et al., 2007; Levine, Marziali, & Hood, 1997;

Rosenthal et al., 2008). One researcher suggested that individuals with BPD experienced 'doomsday signals' in which they experienced overwhelming and intense signs of impending disaster (Krystal, 1974). This contributes to individuals with BPD experiencing intense anxiety, which can feel out of control and never-ending (Hartocollis, 1978).

Recent research has focused on the relationship between psychological distress, affective dysregulation and physiological arousal. Some researchers have speculated that psychological distress is related to an inability to regulate physiological arousal and consequently label corresponding emotions (Albrecht & Porzig, 2003 in Ebner-Priemer et al., 2008; Bohus et al., 2000; Ebner-Priemer et al., 2008; Stiglmayr et al., 2005; Stiglmayr, Shapiro, Stieglitz, Limberger, & Bohus, 2001). It also has been suggested that there is a specific relationship between BPD and alexithymia (inability to label emotions) in that difficulty in identifying, understanding and communicating both emotions and somatic sensations impairs the BPD individual's ability to regulate his/her emotions (Bateman & Fonagy, 2006; Hazlett et al., 2007; Webb & McMurran 2008; Wolff, Stiglmayr, Bretz, Lammers, & Auckenthaler, 2007). This inability to discriminate emotions and somatic sensations explains why individuals with BPD choose to engage in NSSI as a means of emotion regulation (Webb & McMurran, 2008).

Researchers such as Bohus and colleagues (2000) have further suggested that it is the simultaneous effect of physiological arousal and unregulated emotions that increases the individual's overall feelings of psychological distress. Interestingly, Albrecht and Porzig (2003 in Ebner-Priemer et al., 2008) suggested that heightened physical activity during episodes of psychological distress is an important feature of

BPD. This may be related to a common belief held by individuals who do not feel in control of their internal emotional state that one needs to do something physical (e.g., violence) to release unwanted emotions or physiological sensations (Brunner, 2000; Steptoe & Willemsen, 2002). Certainly, it has been identified that individuals who hold the dysfunctional belief that some type of action is necessary to terminate or reduce that unpleasant state are likely to engage in self-destructive behaviours including NSSI (Walsh & Rosen, 1988).

There also is evidence to suggest that compared to NBPD individuals, BPD individuals demonstrate a heightened startle response to unpleasant stimuli (Ebner-Priemer et al., 2005), even when controlling for comorbid anxiety and PTSD (Hazlett et al., 2007). Individuals with BPD also demonstrate hyperactive amygdala activity when viewing emotional stimuli (Donegan et al., 2003; Herpertz et al., 2001). This further supports the argument that BPD is typified by increased emotional intensity.

Several researchers have claimed that individuals with BPD have enhanced sensitivity towards social stimuli (e.g., Carter & Rinsley, 1977; Linehan, 1993) and that they experience increased vigilance for social cues, particularly those that signal danger by way of rejection or threat (Wagner & Linehan, 1999). Hence, it may be the case that for individuals with BPD, affective dysregulation is specifically attributable to social interactions and interpersonal relationships. With this view in mind, there are a number of studies which have focused specifically on the borderline individual's ability to recognise and interpret facial expressions. Results from these studies, however, have remained inconsistent (Domes et al., 2009). One study reported that compared to healthy controls, individuals with BPD were quicker at correctly identifying facial expressions regardless of valence (Lynch et al., 2006).

The authors suggested that this may provide evidence that heightened emotional sensitivity may be a core feature of BPD. In contrast, another researcher stated that individuals with BPD experience cognitive distortions when attempting to recognise facial expressions (Kroll, 1988). Certainly, there is evidence that emotional arousal can interfere with cognitive processes such as attention (Erthal et al., 2005), working memory (Dolcos & McCarthy, 2006) and inhibition (Etkin, Egner, Peraza, Kandel, & Hirsch, 2006). Specifically, research has indicated that emotional arousal interferes with working memory capacity for social stimuli, and this interference is associated with high amygdala activity (Dolcos & McCarthy, 2006).

In a study investigating BPD individuals' capacity to decipher facial expressions, Wagner and Linehan (1999) asked participants to verbally describe a series of faces depicting a particular emotion, and found that individuals with BPD were more accurate in identifying fearful faces. Interestingly, the BPD group also tended to over-report fear when presented with neutral facial expressions. This was interpreted by the authors as evidence for a negativity bias in the interpretation of ambiguous faces in individuals with BPD. Other researchers found that individuals with BPD were less accurate in recognising anger, disgust and fear expressions (Levine et al., 1997). This finding was replicated by Bland, Williams, Scharer and Manning (2004) who found that individuals with BPD demonstrated reduced accuracy for identifying fearful, angry and sad facial expressions. In addition, Domes and colleagues (2008) found that individuals with BPD appeared to have a bias towards perceiving faces as angry when socio-affective cues were ambiguous.

However, a study in 2006 did not find similar results to these previous studies. Instead, the authors found that impaired emotion recognition occurred when

appraisals of combined facial expressions were made (Minzenberg, Poole, & Vinogradov, 2006). It still remains unknown whether individuals with BPD demonstrate a fundamental error in their interpretation of ambiguous stimuli, or whether this negative response bias is a reflection of their difficulties with accurately labelling emotions. This evidence from facial expression research would indicate that individuals with BPD actually demonstrate a reduced capacity for understanding social cues, with a specific negative bias which is influenced by their tendency to see the world as dangerous, and themselves are powerless and not in control (Pretzer, 1990).

When researching the role of social sensitivity in individuals with BPD, some authors have emphasised the influence of empathy in 'reading' nonverbal cues. A small number of studies suggested that individuals with BPD score more highly on measures of nonverbal sensitivity than other people, including individuals with other psychiatric diagnoses (Frank & Hoffman, 1986; Ladisich & Feil, 1988). Both of these studies relied on self-report methods where participants chose their response from a range of possible responses. In the Frank and Hoffman study, participants were given a choice of two possible responses. A more recent study by Guttman and LaPorte (2000) predicted that individuals with BPD would score lower on objective measures of empathy (the Interpersonal Reactivity Index, Davis, 1983). Despite this prediction, BPD participants demonstrated the highest level of empathic concern when compared to participants with anorexia and a non-clinical control group. However, in a follow-up study (Guttman & LaPorte, 2002), the authors found that alexithymia was more prominent in individuals with BPD than it was in a non-clinical control group, and that alexithymia appeared to be inversely associated with

the capacity for empathy.

Taking these inconsistencies into consideration, another study attempted to use a procedure which was designed to permit more objective and reliable assessment of empathic accuracy (Flury, Ickes, & Schweinle, 2007). The authors defined empathic accuracy as the individual's ability to correctly infer the specific content of other people's thoughts and feelings (Ickes, 1993). Using measures of trait accuracy and empathic accuracy, undergraduate students were split into 38 same-sex dyads, each composed of one individual with high BPD traits and one with low BPD traits. The results suggested that the high borderline dyad members displayed better trait accuracy and better empathic accuracy. However, the authors proposed exercising caution when interpreting this phenomenon of heightened borderline empathy. They suggested that this heightened empathy is not evidence of adaptive behaviour, but rather demonstrates an 'obsessive' need to know others' potentially relationship-threatening thoughts and feelings. Furthermore, they speculated that individuals with BPD demonstrate a motivated attributional bias in their interpretations of others' behaviour in that they tend to interpret behaviour through a distorted lens. Hence, their heightened empathy is really a paradoxical effect of having their negative suspicions confirmed (Schmid Mast & Ickes, 2007).

Although individuals with BPD may be accurate at reading other people, they themselves are quite difficult to read, meaning that other people find it difficult to interpret the non-verbal behaviour of individuals with BPD (Flury et al., 2007; Schmid Mast & Ickes, 2007). If a comparison then is made between the accuracy of low-BPD and high-BPD individuals, this in turn would lead to BPD individuals displaying a slight advantage at interpreting the social cues of their partner. In

general, it appears to be the case that individuals with BPD experience difficulties with empathic accuracy, hence one of the proposed inclusions for BPD in DSM-V is that "empathy for others is severely impaired" (Skodol et al., 2011a, p. 9).

There appears to be evidence that individuals with BPD have a fundamental incapacity to process information about their own emotions, and that they are unable to discriminate between feelings (Noy, 1982), particularly "mixed valanced feelings" (Levine et al., 1997, p. 2). There also is evidence to suggest that individuals with BPD are unable to process the experience of ambivalence or paradoxical feelings (e.g., Kroll, 1988). Individuals with BPD may find it difficult to distinguish between positive, negative and neutral emotions and to accurately communicate emotional experiences to others (Waltz & Linehan, 2000). For example, an individual with BPD may casually or even jokingly say that s/he is thinking of suicide, when s/he is actually extremely distressed, thereby not communicating his/her emotions effectively (Waltz & Linehan, 2000).

In general, it can be expected that individuals with BPD will demonstrate elevated levels of dysphoric affect (i.e., unusually high levels of negative mood and low levels of positive mood; Watson, 2000; Watson, Wiese, Vaidya, & Tellegen, 1999), and that they will experience marked affective lability and instability over time (APA, 2000). This affective instability appears to be related to difficulties in handling both internal and external emotional stimuli. These difficulties in dealing both with emotions and with interpersonal relationships appear to contribute to the individual with BPD engaging in impulsive behaviours, including self-injurious behaviours. For the current investigation, the role of self-injury and other impulsive behaviours in individuals with and without BPD will be considered within the

context of affect regulation theory.

Heterogeneity of symptoms

BPD is defined polythetically in that there is a minimum number of symptoms that must be present in order for a diagnosis to be made. This means that two individuals diagnosed with BPD may share only one symptom. Some researchers have argued that there is simply too much heterogeneity in symptoms with the DSM-IV-TR (APA, 2000) requiring at least five out of a potential nine symptoms to be present. This means that there are 256 ways that an individual can meet the diagnostic criteria for BPD. Therefore, there is the potential for individuals with different features to obtain the same diagnosis (Asnaani et al., 2007). Using the DSM-III (APA, 1980) criteria, there were 93 possible combinations of symptoms that could lead to diagnosis of BPD (Clarkin, Widiger, Frances, Hurt, & Gilmore, 1983). It seems that a narrower definition of BPD may resolve some of these issues, but the research currently has been unable to identify which are the best criteria to use (Paris, 2007). The proposed changes for DSM-V include the use of dimensional traits, as well as categories for diagnosing personality disorders with the view that it will reduce this heterogeneity (Skodol et al., 2011a, 2011b). In addition, it has been pointed out that MD and SRDs are actually more heterogeneous than BPD, yet they receive less research attention for issues of heterogeneity (Skodol et al., 2011a, 2011b).

Some authors have suggested that there is no empirical basis for using five criteria over six or seven (Paris, 2007), but state that in any circumstance all domains of pathology (affective, cognitive, impulsive, and interpersonal) should be present in

order for an accurate diagnosis to be made (Zanarini, Gunderson, & Frankenburg, 1989). Despite the controversy regarding symptom composition, there is evidence to suggest that there is a cluster of symptoms that occur more frequently than others. For example, cluster analysis of BPD symptoms has found that affective instability, impulsivity and relationship disturbance are commonly occurring traits in BPD (Hurt, Clarkin, Munroe-Blum, & Marziali, 1992; Sanislow et al., 2002).

Several authors have suggested a return to Grinker and colleagues' (1968) approach of outlining subtypes of BPD (e.g., Fossati et al., 1999; Gunderson, 1984; Sanislow et al., 2002; Skodol et al., 2002; Tyrer, 2005; Whewell, Ryman, Bonanno, & Heather, 2000) which, if applied, would better represent the heterogeneity within the disorder. The majority of these studies have utilised statistical analyses (e.g., factor analysis) in order to group symptoms rather than relying on the presentation of individuals' symptoms and behaviour. However, one study by Leihener et al. (2003) investigated the validity of subtypes in BPD by differentiating between individuals with the same diagnosis on the basis of interpersonal behaviours. Leihener et al. identified two distinct subtypes of BPD which were labelled *autonomous* and *dependent* types. Individuals in the autonomous cluster were likely to describe themselves as aloof and cold, finding it difficult to feel close to others, and at the same time portraying themselves as not being submissive enough. In contrast, individuals in the dependent cluster were likely to portray themselves as being too submissive and having little control over others, lacking in self-confidence and feeling too obtrusive, finding it difficult to communicate their needs to others. The authors recognised that the self-report method used in the investigation may mean that the results have limited applicability and more objective methods are needed. It

has been identified in previous research that there are difficulties in using self-report methods with this population (Hopwood & Morey, 2007; Webb & McMurran 2008).

Another issue which complicates the understanding of BPD symptomatology is that of comorbidity, particularly that of comorbid Axis I diagnoses. Comorbid psychiatric disorders in BPD are common (Lieb et al., 2004) and it is rare for individuals with BPD to be exempt from additional DSM-IV-TR (APA, 2000) diagnoses (Donegan et al., 2003; Rosenthal et al., 2008). The DSM-IV-TR (APA, 2000) limits the number of criteria of any personality disorder to eight or nine criteria, so it is clinically and psychometrically impossible for such a small set of items to describe personality disorders in all of their complexity (Shedler & Westen, 2004). Although some researchers have tried to eliminate confounding effects by excluding individuals with other diagnoses or those taking medication (e.g., Herpertz, Kunert, Schwenger, & Sass, 1999; Rüsch et al., 2008), it must be acknowledged that research sample groups consisting of individuals with BPD who do not meet the diagnostic criteria for any other DSM-IV-TR (APA, 2000) diagnosis would have poor external validity (Donegan et al., 2003; Rosenthal et al., 2008; Schmahl & Bremner 2006). These issues pertaining to comorbidity will be discussed in more detail in Chapter 8.

BPD symptoms in more detail

In order to fully examine the range of experiences by those individuals with BPD, a closer look at individual symptom criteria seems warranted. Further explanation of the clinical meaning behind each of the symptom criterion may assist in the understanding of the complexities of this disorder. As mentioned previously,

some symptoms are more enduring than others including impulsivity, emotional difficulties pertaining to mood and anger symptoms and relationship difficulties, whereas those that are more likely to remit are self-injury, fears of abandonment and identity disturbance (McGlashan et al., 2005; Zanarini, Frankenburg, Hennen, Reich, & Silk, 2006). The following section addresses each of the DSM-IV-TR (APA, 2000) criteria for BPD in more detail.

Frantic efforts to avoid real or imagined abandonment

The inclusion or identification of this criterion is largely attributed to the work of Masterson (1972) and Masterson and Rinsley (1975), resulting in abandonment fears being described as a 'core' feature of BPD (e.g., Kreisman & Straus, 2004). Gunderson and Links (2008) stressed that it is important for researchers and clinicians to differentiate between symptoms of separation anxiety, and a pathological intolerance of being alone, to which this criterion refers. However, interestingly, it has been suggested that as children, individuals with BPD experienced significant levels of separation anxiety (e.g., Aaronson, Bender, Skodol, & Gunderson, 2006). For the individual with BPD, the intense fear of being alone interferes with his/her relationships, disrupts the formation of identity, and contributes to severe mood swings, self-destructive behaviours and anger outbursts (Kreisman & Straus, 2004). Often, these abandonment fears are unwarranted given the situation (e.g., when his/her partner leaves to go to work), and the individual's response to perceived abandonment may be inappropriate for the given context (e.g., calling the partner at work multiple times a day).

The individual with BPD is unable to mediate feelings of anxiety and cannot

be reassured through rationalisation that the absence is only temporary. Deficits in object constancy likely contribute to the fact that individuals with BPD become anxious when important people are not presently with them. The desire to reduce overwhelming and unpleasant feelings contributes to the individual trying to re-establish contact of any sort with the absent person. When contact cannot be instantly re-established (e.g., the partner does not answer his/her phone) the individual with BPD may reach the point where anxiety contributes to significant cognitive distortions. It is during these moments of intense anxiety that the individual starts to look for evidence to give support to the feeling of being abandoned. In these instances the individual convinces him/herself that his/her partner must be cheating, and must be going to leave. The individual with BPD may feel compelled to find an external reason for why s/he feels the way s/he does, rather than attribute his/her emotions to misinterpretations of internal emotional cues.

For some individuals with BPD, it simply may be the case that they worry about being able to control their emotions and behaviours when they are alone. It certainly has been documented that many individuals with BPD demonstrate dependent traits, relying on others to make decisions for them so that they can avoid further anxiety. Some individuals with BPD then put themselves at further risk by choosing partners who are overly controlling and abusive (Ben-Porath, 2004). Certainly, this diagnostic criterion is now recognised by several researchers as a sign of early insecure attachment (Fonagy, 1991; Gunderson, 1996).

Unstable and intense interpersonal relationships (splitting)

One of the hallmarks of BPD is the presence of turbulent interpersonal

relationships (Kreisman & Straus, 2004; Selby, Braithwaite, Joiner, & Fincham, 2008). Individuals with BPD face a constant struggle in their relationships, including family, friendship, work and romantic relationships. Specifically, the DSM-IV-TR (APA, 2000) describes a "pattern of unstable and intense interpersonal relationships characterised by alternating between extremes of idealisation and devaluation" (APA, 2000, p.710). It is not fully understood how these interpersonal problems develop, although Linehan (1993) postulated that emotional invalidation, particularly from parents, is a major contributing factor. Emotional invalidation refers to continued criticising or trivialising of the communication of internal experiences, and also may include the punishment of emotional expression and/or unpredictable patterns of reinforcement to displays of emotion (Selby et al., 2008). Parental emotional invalidation contributes to the development of difficulties in social problem-solving, which continue through to adulthood (Selby et al., 2008), whereby individuals with BPD are left without the appropriate skills to handle difficulties within romantic relationships (Bray, Barrowclough, & Lobban, 2007).

Some researchers have stated that emotional invalidation contributes directly to cognitive distortions such as splitting. This term was coined first by Kernberg (1976) and refers to a type of cognitive disturbance where perceptions of others fluctuate between dichotomies such as 'good' and 'bad'. It reflects a tendency towards black and white thinking where individuals with BPD experience a cycle of worship versus loathing for important people in their lives (Kreisman & Straus, 2004). This constant oscillation between the two contradictions represents a fundamental flaw in object constancy (Fuchs, 2007). The idea that one can retain a positive image of others in spite of temporary separation or rejection, and that one

can be good or bad at the same time is extremely difficult for the individual with BPD (Fuchs, 2007).

Splitting can be used to explain the ways in which individuals with low, unstable self-esteem, such as those with BPD (Zeigler-Hill & Abraham, 2006), segregate negative and positive information about a partner in their memory. According to this theory, the individual's perceptions of others shift according to which category (i.e., 'good' or 'bad') is activated in his/her memory at the time (Graham & Clark, 2006). In contrast, individuals with high, stable self-esteem are able to integrate both positive and negative memories (Graham & Clark, 2006). Kreisman and Straus (2004) suggested that this polarity in black and white thinking acts as a protective factor against the anxiety that accompanies attempts to resolve paradoxical feelings.

Identity disturbance

Individuals with BPD suffer from a fundamental inability to establish a coherent self-concept (Jorgensen, 2009; Kernberg, 2006; Zeigler-Hill & Abraham, 2006). Yet, identity disturbance as a concept that distinguishes individuals with BPD from those with other disorders has been difficult to define, and rarely researched (Wilkinson-Ryan & Westen, 2000). Some researchers have stated that identity is one of the most important characteristics of BPD and that it can be used to explain the relationships between chronic feelings of emptiness, affective instability, abandonment fears and self-injurious behaviour (Clarkin, Hull, & Hurt, 1993; Jorgensen, 2006a, 2006b, 2009, 2010). Some authors further have stated that symptoms of BPD are causally embedded in a sense of poorly integrated identity

(Crawford, Cohen, Johnson, Sneed, & Brook, 2004; Jorgensen, 2006b, 2009).

The majority of researchers have reported that individuals with BPD are distressed by difficulties with identity (e.g., Jorgensen, 2009, 2010; Wilkinson-Ryan & Westen, 2000). Research has identified that women are more likely to be identified as demonstrating this criterion than men (Johnson et al., 2003) and that this criterion may be related to a sexual abuse history. Approximately 30-75% of individuals with BPD have reported histories of sexual abuse, particularly during childhood (Ogata et al., 1990; Zanarini et al., 1997). Potential links between childhood sexual abuse and impulsivity in BPD will be discussed in Chapter 6.

The relationship between childhood abuse and dissociation has been well documented (e.g., Brodsky, Cloitre, & Dulit, 1995; Goldsmith, Frey, & De Prince, 2009; Jepsen, Svagaard, Thelle, McCullough, & Martinsen, 2009), and it has been suggested that identity disturbance perhaps is a characteristic of severe abuse history rather than of BPD (Wilkinson-Ryan & Westen, 2000). Nevertheless, the identity criterion has been used as a basis for classification of subtypes of BPD (e.g., Wilkinson-Ryan & Westen, 2000).

Some researchers have used the identity disturbance criterion to offer a definition of BPD. For example, Bender and Skodol (2007) stated that "borderline psychopathology emanates from a profound disturbance in ability to create, maintain, and use benign and integrated images of self and others, which leads to emotional instability" (p.501). According to Fuchs (2007), individuals with BPD tend to adopt a 'post-modernist' stance towards their life, by changing from one present to the next and being totally identified with their present state of affect. Individuals frequently may make sudden changes in their religion, sexual orientation, values, goals, friends

and career, and typically self-image is based on being bad or evil (APA, p. 707). In the same way that individuals with BPD use splitting by viewing others as 'all bad' or 'all good', so too do they apply this reasoning to themselves (Fuchs, 2007). According to Kernberg (1976), the individual with BPD experiences fluctuations in his/her view of self so that one can be grandiose or corrupt, dominant or powerless, victim or victimiser but never simultaneously. Rather, these contradictory views of self follow each other in the individual's mind and s/he is rarely able to recognise the contradiction. Fuchs (2007) described this experience as an endless repetition of the same affective states which creates a "peculiar atemporal mode of existing" (p. 382).

Impulsivity

Impulsivity, in particular trait impulsivity, has been described as the most common symptom of BPD (e.g., Bornovalova, Fishman, Strong, Kruglanski, & Lejuez, 2008; Chapman, Dixon-Gordon, Layden, & Walters, 2010; Kreisman & Straus, 2004; Millon, 2000) as it triggers many associated behaviours such as angry outbursts, violence, mood swings, and destructive behaviours. This criterion has remained unchanged since its introduction in 1980 and research has suggested that it is one of the traits that best differentiates BPD from other personality disorders (Morey et al., 2002). Impulsivity is the symptom which is most likely to persist over time and to be associated with unremitting BPD pathology (Kreisman & Straus, 2004). It is of note that impulsivity and impulsive behaviours associated with BPD are self-destructive. Substance use, risky sexual behaviour, gambling, shoplifting, excessive spending, self-injury, binge eating and associated eating disorder behaviours all have the potential to cause great physical and psychological damage to

the individual with BPD.

Some researchers have hypothesised that gender differences noted in BPD may be a function of impulsivity (Zanarini et al., 1998). For example, it has been suggested that women may be more likely to use internalising behaviours (e.g., binge eating) and men to use externalising behaviours (e.g., property damage or acts against others) in ways that are self-destructive (Johnson et al., 2003). It is likely that individuals with BPD exchange one impulsive behaviour for another at different times, or to meet different needs. For example, stealing and excessive spending may be correlated with drug and alcohol use, whereas binge eating may be used in addition to self-cutting (Gunderson & Links, 2008; Kreisman & Straus, 2004).

Kreisman and Straus (2004) suggested that borderline impulsivity can be distinguished from impulsivity in other disorders in that the behaviours are usually reactions to disappointments from someone else. This would imply that the motivations behind impulsive behaviours are external and operant in nature rather than serving some internal motivation such as the desire for tension reduction. The nature and extent of impulsive behaviours in BPD will be discussed further in Chapter 6.

Recurrent suicidal behaviour, gestures, or threats, or self-mutilating behaviour

The clinical importance of recurrent suicidal behaviour or NSSI and its relationship to other BPD symptomatology will be discussed in detail in subsequent chapters. In brief, BPD is the only psychiatric diagnosis in the DSM-IV-TR (APA, 2000) which includes self-injury as a criterion. Specifically, criterion 5 refers to 'recurrent suicidal behaviour, gestures, or threats, or self-mutilating behaviour'

(p.710). Some authors have considered NSSI to be one of the most defining characteristics of BPD (Gunderson & Ridolfi, 2001; Soloff, Lynch, Kelly, Malone, & Mann, 2000).

Affective instability

Affective instability is frequently cited as one of the fundamental components of BPD (e.g., Cowdry, Gardner, O'Leary, & Leibenluft, 1991; Koenigsberg et al., 2001). Early references to affective instability in BPD can be attributed to Grinker and colleagues' (1968) observations of borderline patients. These observations prompted researchers to propose that the fundamental symptomatology of BPD relates to affective instability (e.g., Klein, 1975, 1977; Stone, 1979, 1980).

Individuals with BPD experience significant problems in managing emotions, particularly anger and anxiety (Levine et al., 1997). They also experience rapid mood fluctuations that are almost always a reaction to external stimuli, unlike other disorders where mood tends to be internally driven (Kriesman & Straus, 2004; Paris, 2008). Similarly, the DSM-IV-TR (APA, 2000) emphasises *reactivity* (i.e., attributing external causes) of mood and typical duration of mood fluctuations *usually lasting a few hours and only rarely more than a few days* (p. 707). Due to the fact that affective instability is such a prominent feature of BPD, it has been suggested that the disorder is better classified as a subtype of mood disorder (e.g., Perugi, Toni, Travierso, &, Akiskal, 2003). It is likely that individuals with BPD experience more frequent and erratic changes in mood during the course of a day than other individuals with a diagnosed mood disorder, whose moods change less abruptly (Kresiman & Straus, 2004). Paris (2008) pointed to the fact that, in classic mood

disorders, the individual presents with consistently low or elevated mood and it is not possible to 'cheer up' or 'bring down' someone who is experiencing a depressive or manic episode. However, he stated that in BPD the individual can present with a different mood every day or even as rapidly as every hour, highlighting the important role of external factors.

Recently, research has pointed to the fact that moods associated with BPD may not involve the entire spectrum of emotions. Rather, BPD tends to be associated with specific, negative moods including anger, anxiety, and transient depression and anxiety (Kreisman & Straus, 2004). The relationship between affective instability and BPD will be covered in more detail in Chapter 4.

Chronic feelings of emptiness

Chronic feelings of emptiness in BPD has been less researched than some of the others and, therefore, remains poorly understood (Klonsky, 2008). Early conceptualisations of this characteristic can be traced back to psychoanalytic theory where authors such as Abraham (1927) and Freud (1908/1959) believed that if the oral phase was not completed in infancy, this created a disposition towards depression and a desire for object-relatedness in adults (Gunderson & Links, 2008). This view was expanded by object relations theorists (e.g., Klein, 1932, 1946) who suggested that inadequate parenting resulted in a failure for the individual to develop appropriate abilities in object constancy that are essential for self-soothing (i.e., being able to reassure oneself by imagining that a loved one still cares about you even if they are not immediately present). Without object constancy, the individual is vulnerable to these subjective feelings of emptiness.

Emptiness is related to depressive symptoms (Trull & Widiger, 1991) but for some individuals this criterion may be difficult to assess because many individuals who are assessed for BPD do not really understand this term (Widiger & Sanderson, 1995). Even clinical definitions are somewhat complex. For example, Gunderson and Links (2008) stated that "emptiness is a visceral feeling, usually in the abdomen or chest, not to be confused with fears of not existing or existential anguish" (p. 12). Balint (1992) simply defined emptiness as intensified feelings of 'something missing'. It is perhaps not surprising then that Johansen and colleagues (Johansen, Karterud, Pedersen, Gude, & Falkum, 2004) found that chronic emptiness as a criterion demonstrated the lowest correlation for diagnostic efficiency. Nevertheless, chronic emptiness reportedly is present in approximately 71-73% of individuals with BPD (Grilo et al., 2001; Johansen et al., 2004).

This lack of clarification is apparent in earlier editions of the DSM. For example, criterion 7 in DSM-III (APA, 1980) and DSM-III-R (APA, 1987) referred to chronic feelings of emptiness *or* chronic feelings of boredom. DSM-IV-TR (APA, 2000) now limits its definition to emptiness only, as research offers little support for the existence of a relationship between the two constructs (Klonsky, 2008; Kreisman & Straus, 2004). Rather, it is now believed that boredom is more characteristic of Narcissistic Personality Disorder (Gunderson, 1996).

According to Gunderson (2007), emptiness is the symptom which is most resistant to alteration. Emptiness is closely related to feelings of hopelessness, loneliness and isolation (Klonsky, 2008). With specific reference to NSSI, feelings of emptiness and loneliness and isolation have been associated with the individual's emotional state both before and after NSSI (Klonsky, 2008). The relationship to

hopelessness is of importance because hopelessness is a strong predictor for suicide (Beck, Brown, Berchick, Stewart, & Steer, 1990). Klonsky (2008) noted that after criterion 5 (self-injury and suicidal behaviour), emptiness was more strongly related to suicidal ideation than any other BPD criterion, yet the relationship between emptiness and suicide was weak. Hence, it may be the case that emptiness is a valuable diagnostic criterion, but there are definitional issues that need to be further refined, and further research is required to clarify its role in BPD diagnosis and treatment.

Inappropriate, intense anger

Kernberg (1967) first proposed that the source of BPD symptoms was related to excessive aggression. He suggested that the source of this aggression stemmed from temperamental excess or as a result of frequent exposure to frustration as an infant. The quick reactivity of individuals with BPD, and a lack of strategies to handle arousal, is frequently cited as a core feature of the disorder (Linehan, 1993). It would seem that this propensity towards inappropriate anger is triggered by a combination of low frustration tolerance, and vulnerability towards misinterpretation of social cues, which contributes to the individual with BPD being rather easily offended. If the individual with BPD interprets stimuli as threatening or unjust, then s/he responds with anger, which may include physical fights (Selby et al., 2010). Millon (2000) described individuals with BPD as being easily angered by the failure of others to respond in the way that they want, hence they use anger and self-destructive behaviour as a way to "get back" at others and to "teach them a lesson" (Millon, 2000, p. 125). Zanarini and Frankenburg (1994) described a vulnerability in

individuals with BPD towards a 'hyperbolic' temperament, which refers to a tendency to easily take offence and an attempt to manage these feelings by insisting that others pay attention to the enormity of his/her inner pain.

However, despite the belief that individuals with BPD seem to suddenly 'explode' in response to minor irritations, Kreisman and Straus (2004) suggested that, for the borderline individual, anger is always present but is suppressed by their fear of abandonment. Furthermore, Gunderson and Links (2008) suggested that many individuals with BPD are aware of feeling angry for the majority of the time, but that they rarely express it. It has been suggested that anger lability can be used to predict a diagnosis of BPD over other personality disorders in 72% of cases (Kreisman & Straus, 2004). This may be useful in differentiating between other disorders such as Bipolar Disorder (BP), in which mood fluctuations are less likely to be attributable to anger. Some researchers have suggested that with the plethora of attention that has been given to BP, clinicians have mistakenly developed a tendency to equate episodes of anger to mood swings of BP, forgetting about other causes (Sumit, 2006). The context of anger and associated behaviours in BPD will be covered in more detail later.

Transient, stress-related paranoid ideation or severe dissociative symptoms

As mentioned previously, the term 'borderline' was originally based on the belief that patients were on the border of psychotic functioning (e.g., Knight, 1953). Modern conceptualisations of BPD have pointed to the fact that psychotic symptoms may still be an enduring characteristic of BPD, at least for some individuals. Symptoms falling under criterion 9 may include hallucinations, confused thinking,

paranoia and feelings of numbness and unreality, which are usually precipitated by stress. Observations of these symptoms in BPD have been noted for several years, although they were not formally included in diagnosis until DSM-IV-TR (APA, 2000). Although this edition does not refer specifically to 'psychosis' under this criterion, estimates of individuals with BPD who demonstrate psychotic symptoms are approximately 24% (Pope, 1985). It has been identified that 'clear cut' experiences of psychosis including delusions and hallucinations are rare in individuals with BPD (Jonas & Pope, 1984). However, DSM-IV-TR (APA, 2000) does make reference to psychotic-like symptoms, namely, "hallucinations, body-image distortions, ideas of reference, and hypnagogic phenomena" (p. 708) as associated features of the disorder.

Paris (2007) referred to symptomatology under criterion 9 as "micropsychosis", stating that patients with BPD "experience paranoid feelings without interpreting them delusionally, hear voices or see visions while understanding that these perceptions were imaginary, and experience depersonalisation without impaired reality testing" (p.465). It also has been suggested that the presence of these symptoms can be reliably used to distinguish BPD from other personality disorders, such as Schizotypal personality disorder (Yee, Korner, McSwiggan, Meares, & Stevenson, 2005; Zanarini et al., 1990).

Traditionally, clinicians and researchers have been wary of including criterion 9 in the diagnosis of BPD as it is often considered that episodes of psychosis represent a distinct, separate clinical disorder (Gunderson & Links, 2008). It is of interest, however, that neither family history studies nor biological research has supported a link between BPD and schizophrenia (White, Gunderson, Zanarini, &

Hudson, 2003). This may suggest that psychotic symptoms in BPD have a unique role in this disorder.

Transient, stress-related severe dissociative symptoms or paranoid ideation affect approximately 50% to 75% of individuals with BPD (Yee et al., 2005; Zanarini et al., 1990), and symptoms of derealisation and depersonalisation are more common (Chopra & Beatson, 1986). Some researchers have suggested that transient stress-related symptoms in BPD are relatively common (e.g., Chopra & Beaton, 1986; Kernberg, 1976), particularly for individuals in an unstructured environment (Chopra & Beatson, 1986; Kreisman & Straus, 2004). The onset of these symptoms in BPD is likely to be sudden and unexpected but can be identified as being precipitated by severe anxiety (Chopra & Beatson, 1986) and feelings of abandonment (Kreisman & Straus, 2004). Nevertheless, differential diagnosis may be difficult as the cognitive symptoms of BPD can occasionally be florid (Paris, 2007).

Unlike other disorders such as Schizophrenia and BP, insight and reality testing tend to remain intact during psychotic episodes associated with BPD (Paris, 2007). Furthermore, these symptoms in BPD are transient, and dissipate in a matter of minutes or hours, once the individual's anxiety has been alleviated (Chopra & Beatson, 1986; Kreisman & Straus, 2004). DSM-IV-TR (APA, 2000) states that "the real or perceived return of the caregiver's nurturance may result in a remission of symptoms" (APA, 2000. p. 708). For individuals to be diagnosed as experiencing a brief psychotic episode, DSM-IV-TR (APA, 2000) stipulates that symptoms persist for at least one day, and up to three months in duration.

Some researchers have questioned the validity of psychotic symptoms as a criterion of BPD, suggesting that this phenomenon is rare (e.g., Spitzer et al., 1979).

During the 1980s, there was much debate about the appropriateness of including psychotic symptoms as an additional criterion. Therefore, DSM-IV-TR (APA, 2000) is careful not to refer specifically to psychosis. Some researchers have suggested that psychotic symptoms in BPD are likely to be factitious, noting the correlation of BPD features in patients with factitious psychosis (e.g., Jonas & Pope, 1984; Pope, 1983, 1985). Examining the observation that psychotic symptoms may be brought on by feelings of abandonment and then resolved by caregiver reassurance, it is possible to view these symptoms as operant in nature. That is, the potential for individuals to feign psychotic symptoms as a maladaptive coping strategy for seeking relief from anxiety is possible. This would certainly fit with the stereotype of individuals with BPD being manipulative, and constantly seeking destructive ways of gaining attention. However, the current research literature would indicate that psychotic features in BPD are more commonly a genuine symptom of anxiety and distress (Benvenuti et al., 2005).

Symptoms of dissociation including depersonalisation (feelings as though one is detached from, or is an outside observer of one's mental processes and/or body) and derealisation (an alteration in perception of the external world where it feels strange or unfamiliar) have typically been associated with BPD, self-injury and childhood sexual abuse. Dissociative symptoms are recognised as a coping strategy for individuals who have been sexually abused (Chu & Dill, 1990; Herman et al., 1989; Romans, Martin, Anderson, & Herbison, 1995; Shearer, 1994a, 1994b; van der Kolk, Perry, & Herman, 1991; Zanarini, Ruser, Frankenberg, & Hennen, 2000). The consequences of these symptoms for individuals who experience dissociation include identity confusion, amnesic episodes, and impairment in sensory and motor

functioning (Brunner, Parzer, Schmitt, & Resch, 2004). In a study comparing dissociative experiences in individuals with BPD and individuals with Schizophrenia, Brunner et al. (2004) noted that for the borderline group, experiences of estrangement associated with depersonalisation and derealisation were more common. It may be the case that for individuals with BPD, their dissociative symptoms are linked with criterion 3 (identity disturbance) and criterion 7 (chronic emptiness).

The DSM-IV-TR (APA, 2000) stipulates that, in general, paranoid ideation and dissociative symptoms in BPD are of "insufficient duration or severity to warrant an additional diagnosis" (p.708), yet some researchers have argued that manifestations of these symptoms in BPD are better explained by concurrent Axis I pathology such as Substance-Related Disorder (SRD) or Schizophrenia. Certainly, it may be the case that for some individuals an additional diagnosis may be necessary. There have been instances where psychotic symptoms in individuals with BPD have been attributed to substance abuse and comorbid mood disorders (Benvenuti et al., 2005; Gunderson & Phillips, 1991; Pope, 1985; Stone, 1980). Hence, an accurate assessment of criterion 9 needs to incorporate the potential comorbidity of mood, substance and schizophrenic disorders.

Course of BPD and severity of symptoms over time

The heterogeneity of individuals with BPD means that some individuals with the disorder will be relatively high functioning whereas others may be functioning at a lower level, experiencing extended unemployment, chronic suicidality, social isolation and frequent hospitalisations (Wagner & Linehan, 1999). Generally

speaking, the symptoms of BPD are considered to be stable over time, however, there is some evidence that the severity or intensity of symptoms reduces as the individual's age increases (Shea et al., 1999). There also have been suggestions that 'recovery' or remission from BPD is possible with appropriate treatment, with the length of time reportedly ranging from six months (Gunderson et al., 2003) to five to seven years (Najavits & Gunderson, 1995). Nevertheless, a large proportion of individuals with BPD continue to meet the diagnostic criteria for the disorder well past middle age (Stone, 1992). In addition, most individuals with BPD will continue to meet the criteria for other disorders such as depression, even if there are moderate improvements in BPD specific symptoms (McGlashan, 1986).

It has been suggested that there are four factors which can be used to determine the severity of BPD (Zanarini & Frankenburg, 2007; Zanarini, Frankenburg, & Parachini, 2004). The first factor is the number of comorbid Axis I disorders, with milder cases of BPD being associated with fewer comorbid disorders, particularly anxiety disorders (Zanarini et al., 2004). The second factor involves the level of psychosocial impairment. As mentioned previously, some individuals with BPD function in the community relatively well and successfully manage the demands of school and work. However, others struggle to cope with these demands and experience regular periods of unemployment where they rely on social security payments to get by. The third factor refers to the will of the individual with BPD to get better. Zanarini and Frankenburg (2007) suggested that the strength of desire to remain in the role of the chronic patient has important implications for predicted functioning. Finally, the fourth factor relates to help-seeking. It has been identified that some individuals with BPD actively engage in available treatment and are

hopeful about their future, whereas others have a 'toxic' reaction to therapy and maintain a firm belief that they are unable to benefit from assistance.

There is limited understanding of the processes which contribute to the maintenance of BPD symptoms. The empirical evidence regarding effective treatment approaches (e.g., Dialectical Behaviour Therapy, DBT) is also limited. A few approaches appear promising, but there remains incomplete confirmation about the efficacy of treatments over time (Bateman & Fonagy, 2006; Brown, Newman, Charlesworth, Crits-Christoph, & Beck, 2004; Clarkin, Levy, Lenzenweger, & Kernberg, 2004; Clarkin, Yeomans, & Kernberg, 1999; Linehan, 1993; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Meares et al., 1999; Munroe-Blum & Marziali, 1995; Ryle, 2004). Unsurprisingly, drop-out rates from therapeutic treatment programs targeted at this population continue to be high, which has contributed to the difficulty in measuring the effectiveness of an entire course of treatment.

Summary

BPD certainly is a complex disorder which has taken on many forms since Stern's 1938 description of patients on the borderline between psychosis and neuroses. Compared to other personality disorders, BPD is frequently described as less stable both in symptom presentation and course of the disorder (Benazzi, 2008). However, prevalence rates in the general population have remained at 1 to 2% (Lenzenweger et al., 2007; Paris, 1999; Torgersen et al., 2001).

There have been a variety of theories put forth to explain the disorder, including psychoanalytic, trauma, attachment, behavioural, biological and biosocial.

The majority of these theories support the view that a core feature of BPD is difficulties with affect regulation. It may be the case that for individuals with BPD, there is a specific pattern of sensitivity and heightened responding towards emotionally evocative stimuli (Linehan, 1993). Individuals with BPD are likely to experience heightened intensity of emotion, slow return to baseline following emotional arousal, and diminished capability for using self-soothing strategies to recover from unpleasant negative emotions (Ebner-Priemer et al., 2008; Mennin et al., 2005).

Certainly, there is evidence to suggest that affective dysregulation in BPD is characterised by the intensity of negative emotions, rather than positive ones (Conklin et al., 2006; Ebner-Priemer et al., 2007; Levine et al., 1997; Rosenthal et al., 2008). There also is evidence to suggest that psychological distress is related to an inability to regulate physiological arousal. Research has suggested that individuals with BPD experience a heightened startle response and hyperactive amygdala activity associated with unpleasant stimuli. This supports the view that BPD is typified by increased emotional intensity.

It also has been suggested that individuals with BPD have enhanced sensitivity towards social stimuli and that they tend to be vigilant towards cues that are perceived as dangerous or threatening. Hence, it may be the case that for individuals with BPD, affective dysregulation is specifically attributable to social interactions and interpersonal relationships. Researchers have claimed that individuals with BPD experience cognitive distortions when attempting to interpret ambiguous facial expressions, which appears to be related to alexithymia and a negativity bias towards the perception of threat. Hence, it has been speculated that

individuals with BPD have a reduced capacity for social cues, tending to see the world as dangerous, and themselves are powerless and not in control (Pretzer, 1990). Other researchers have had a particular interest in the role of empathy in BPD, with some researchers suggesting that these individuals have a reduced capacity for empathy, whereas others have suggested that they are particularly skilled at reading non-verbal cues. However, research in this area tends to be inconsistent and is wrought with methodological issues that complicate the interpretation of results. Hence, it appears that there is currently limited value in the inferences to be made from this area of research.

The diagnosis of BPD has remained a hotly contested topic for several decades. Much of the debate surrounds issues such as heterogeneity of symptoms and issues of comorbidity, appropriateness of use and name of the disorder, and indeed the validity of BPD even existing as a diagnosis. Over time, the term 'borderline' has been used as something of a miscellaneous diagnosis used to define patients who do not fit into other classifications (Kreisman & Straus, 2004). At the other end of the spectrum, some clinicians avoid using the diagnosis due to factors such as fears of stigmatisation, insurance issues associated with Axis II diagnoses, and non-rigorous diagnostic procedures.

It has been suggested that the term Borderline Personality Disorder is vague and means little to laypeople who are trying to understand this complex disorder. Hence, some researchers have proposed the name of the disorder be changed to better reflect the core features of BPD. Despite this, there is little indication that the name of the disorder will change in the foreseeable future (Skodol, 2011).

BPD is defined polythetically in that there is a minimum number of

symptoms that must be present in order for a diagnosis to be made. With five out of a potential nine symptoms needing to be present to make a diagnosis, this means that there are 126 different ways that an individual can meet the criteria for BPD (Asnaani et al., 2007). It appears that there is not a great deal of empirical basis for using five criteria over six or seven (Paris, 2007), but perhaps a comprehensive diagnosis needs to include affective, cognitive, impulsive, and interpersonal factors (Zanarini et al., 1989). Certainly there are some symptoms of BPD that occur more frequently than others, such as affective instability, impulsivity and relationship disturbance (Hurt et al., 1992; Sanislow et al., 2002). It may also be the case that sub-typing of BPD features would be a useful way of capturing heterogeneity.

Another issue which complicates the understanding of BPD symptomatology is the level of comorbidity, particularly with Axis I diagnoses. However, it is rare for individuals with BPD to be free from the influence of other conditions, medications or substances. Although this complicates issues of differential diagnosis and validity, multiple symptoms is part of the complexity of the BPD diagnosis, and it is likely that nine criteria is insufficient to fully account for the complexities of this disorder. Furthermore, it seems important to acknowledge that although research sample groups consisting of so-called 'pure' borderline individuals appear to be advantageous, such a sample surely would have poor external validity (Donegan et al., 2003; Rosenthal et al., 2008; Schmahl & Bremner 2006).

The heterogeneity of symptoms in individuals with BPD means that some individuals with the disorder will be relatively high functioning, whereas others may be functioning at a much lower level. In general, the symptoms of BPD are stable over time, but certain aspects such as impulsivity, self-injury and suicidal behaviours

may decrease with age. Certain researchers have endorsed the view that one can recover from BPD, but the very nature of personality disorder diagnosis implies an enduring pattern of behaviour, which is resistant to change. Throughout their lives, it appears that individuals with BPD continue to meet the diagnostic criteria for other disorders, notably mood disorders, anxiety and PTSD, even if there are moderate improvements in BPD specific symptoms. Zanarini and colleagues (2004, 2007) suggested that the functioning of the individual with BPD depends on factors such as the number of comorbid disorders, level of psychosocial impairment, willingness to get better, and attitude towards help-seeking and the therapeutic process.

Individuals with BPD have a fundamental incapacity to process information about their own emotions, and that they are unable to discriminate between feelings particularly the experience of ambivalence or paradoxical feelings (e.g., Kroll, 1988). They demonstrate elevated levels of dysphoric affect (i.e., unusually high levels of negative mood and low levels of positive mood; Watson et al., 1999), and marked affective lability and instability over time (APA, 2000). Difficulties with emotional processing and responding appear to be related to both internal and external stimuli. These difficulties in dealing both with affect regulation and with interpersonal relationships appear to contribute to the individual with BPD engaging in impulsive behaviours, including self-injurious behaviours.

Despite years of research, and the fact that BPD is one of the most popularly researched disorders, it does appear that research in this area is really still in its infancy. There is a great deal that remains unknown about BPD, including which of the features of BPD (affective, impulsive, cognitive or interpersonal) are the most critical. It would seem that science is often advanced by the simplification of

complex phenomena. However, a reduction in complexity is not always useful or appropriate, and may fail to address some of the evolving properties of complex systems (Paris, 2007).

CHAPTER 4

Affect regulation theory and its relationship to self-injury and BPD

The role of emotion

There is little consensus among researchers as to an adequate definition of emotion. However, it is generally recognised that emotions are an important aspect of human experience, often mediating the manner in which internal and external events are perceived and experienced. James (1884) stated that emotions occur from the perception of changes in the individual's internal and/or external environment and greatly influence consciousness and cognitions.

Modern theories about the importance of emotions tend to focus on a functionalist approach, placing emphasis on the adaptive value of emotions (e.g., Gross, 1998a). From this perspective, emotions can be described as cues for readiness to act (also referred to as action tendencies) that work to establish, maintain or disrupt significant relationships that the individual has with his/her own internal and external environment (Barlow, 2002; Campos, Campos, & Barrett, 1989; Lang, Bradley, & Cuthbert, 1998). Emotions also serve an information providing function and play an important role in judgement and decision making (Gohm & Clore, 2002). However, emotions are not always adaptive and, certainly, the way in which the individual manages his/her emotions is linked to the development and maintenance of psychopathology (Bradley, 2000).

There are several primary emotions (e.g., anger, guilt, shame, embarrassment) that are believed to possess clear adaptive functions by facilitating an appropriate response to both internal and external experiences (Oatley & Jenkins, 1996). In other examples, happiness and joy are believed to facilitate one's sociability prompting the continuation of rewarding experiences (Carver, 2004). Embarrassment is believed to signal appeasement, and evoke forgiveness in others (Keltner & Kring, 1998; Miller

& Leary, 1992; Parrott, 2001), whereas sadness is associated with cues for support and assistance (Campos et al., 1989; Oatley & Jenkins, 1996). Guilt is believed to direct one's awareness towards change and improvement whereas anger signals the presence of perceived injustice (Mayer & Salovey, 1997) prompting aggression and other self-protective behaviours.

Delineating emotion from affect and mood

The terms 'affect' and 'emotion' are often used synonymously (Herpertz et al., 1999). However, some researchers have suggested that affect can be distinguished from emotion by being less clearly related to a stimulus, longer lasting and more cognitively complex (Goldsmith, 1994). Emotion also can be used to refer to an affective state that has been appraised as good or bad (Clore & Tamir, 2002).

Gross (1998a) further suggested that affect refers to the behavioural components of emotion. It also may be important to further distinguish emotion and affect from mood. The DSM-IV-TR (APA, 2000) defines mood as "pervasive and sustained" whereas affect refers to "more fluctuating changes" (p. 825). For the purposes of the current investigation, the definition of affect given by Gross (1998a), which refers to the behavioural components of emotion, will be used to maintain reliability as this term refers more specifically to observable and measurable phenomena. Furthermore, Clore and Tamir (2002) suggested that is it useful to think of emotions as affective states with objects and moods as affective states without objects.

Categories of emotional experience

Gohm and Clore (2002) have identified five conceptual categories of emotional experience including emotional clarity, attention to emotions, affect intensity, absorption in emotions, and emotional expressivity. Each of these variables can be related to emotional intelligence, that is, the ability to use emotions for adaptive purposes (Mayer & Salovey, 1997). Three of these variables have been included in a process model of emotion proposed by Gohm (2003) which proposes that individual differences in emotional clarity, affect intensity and attention to emotions are likely to moderate the overall experience of emotion. Further, this may provide insight into the ways in which individuals react to and cope with emotional experiences.

Clarity

Clarity in understanding one's emotions has been described as an essential feature of emotion processing. Being able to understand emotions requires the individual to differentiate aspects of affective information from different situations (Barrett, Gross, Christensen, & Benvenuto, 2001; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). In order to use emotions in an adaptive way, the individual needs to be able to define and describe emotions in a meaningful way, rather than just label them as 'bad' or 'good' (Gohm, 2003). An ability to differentiate between similar feelings allows one to better understand the cause of the emotional experience, the relational context in which it occurred, and what the appropriate behavioural response might be (Barrett et al., 2001). In this way, emotional clarity is skill associated with adaptive affect regulation (Barrett et al., 2001). It could be argued

that individuals with BPD may lack skills in emotional clarity due to their tendency towards a black and white thinking style, and potential difficulties with alexithymia.

Attention

Attention to emotions has been described as the ability to take notice of and place value on one's emotional experiences (Gohm, 2003). An awareness and sustained attention of one's moods or the ability to 'keep tabs' on the presence of affect serves an adaptive purpose. It facilitates the ability to use emotion in a positive and meaningful way. Individuals who ignore or are unaware of their emotional states, or who judge them to be unnecessary or irrelevant struggle to identify different feelings and may have difficulty regulating their emotions (Gohm, 2003). Sensitivity to physiological changes is also associated with varying levels of affect (Larsen, 2000). It has been suggested that those individuals who are more attentive towards their emotions are more likely to seek social support in gaining help with problems (Gohm & Clore, 2002). It also is worth noting that hypervigilance towards emotions also can have negative consequences such as rumination and worry (Sloan, 2005). Another view put forth by Lischetzke and Eid (2003) is that attention to emotions is neither beneficial nor harmful but proficiency in regulating emotions is a core skill in emotional adaptation.

Intensity

The overall experience of emotion is also influenced by the intensity with which the individual experiences emotion. The magnitude of one's emotional response tends to be associated with the magnitude of the associated stimulus, but

this is very much an individual and subjective process (Diener, Larsen, Levine, & Emmons, 1985). Some researchers have believed that the intensity of one's emotional experience is a stable trait which can be generalised across different categories of emotions regardless of frequency of occurrence (Bachorowski & Braaten, 1994; Larsen & Diener, 1987). By this reasoning, individuals who experience strong, positive emotions in response to a positive event should also experience strong, negative emotions in response to perceived negative events (Larsen & Diener, 1987). Individuals who experience affective intensity may be more likely to perceive anxiety symptoms as more intense (Vujanovic et al., 2006) and have negative expectations about their ability to regulate emotions (Flett, Blankstein, & Obertynski, 1996). It also has been suggested that individuals who experience intense emotions may be less likely to regulate his or her emotions because doing so should be more difficult (Gohm, 2003). In contrast, individuals who experience emotions with too little intensity may have limited access to important information about their own behaviour (Gohm, 2003).

Affect regulation theory

Affect regulation is considered to be the "processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998a, p.275). It is understood to be a process-oriented mechanism that involves situation selection, situation modification, attention deployment, cognitive change and response modulation (Gross, 1999). It is a mechanism that is associated with the regulation of one's own affect rather than an influence on the affect of others (Gross, 1998a).

Several researchers have suggested that it is important to keep in mind that affect regulation is not simply a matter of reducing negative emotions (Cole, Michel, & Teti, 1994; Gross, 1999). It involves a range of adjustments that organise and promote adaptive functioning, both momentary and ongoing (Cole et al., 1994). Indeed, theories of affect regulation should encompass increase, decrease and maintenance of negative and positive affect (Gross, 1999).

According to Gross (1998a, 1999), there are a number of constructs that may overlap with affect regulation including coping, impulsivity, sensation seeking, self-monitoring, mood regulation, repression, ruminating, distraction, emotional intelligence and so on. In developmental theory, the acquisition of the ability to regulate emotions and related behaviours is of major significance (Cicchetti, Ganiban, & Barnett, 1991; Dodge, 1989; Eisenberg & Fabes, 1992; Kopp, 1989).

Emotional dysregulation

Definitions of emotion dysregulation are diverse but, typically, they include reference to interference in the processing of internal and external stimuli (e.g., Dodge, 1991; Plutchik, 1980), difficulties with the flexible integration of emotion with other processes (Cicchetti et al., 1991), and difficulty in controlling the experience and expression of emotions (Kopp, 1989). From a developmental perspective, emotion dysregulation is thought to represent a shortcoming in meeting the tasks of emotional development (Cicchetti et al., 1991; Dodge & Garber, 1991).

A fundamental component of emotions is that they are inherently regulatory and regulated. These two processes are subsumed under the term affect regulation (Cole et al., 1994). Certain patterns of emotion regulation may impair or interfere

with functioning. This interference may involve disruption to attention, interpersonal relationships and social functioning, which then supports or becomes symptoms of psychopathology (Cole et al., 1994). Researchers have used the term emotion dysregulation to refer to the problems associated with this interference in functioning.

A number of researchers have suggested that several Axis I and Axis II disorders are likely to be characterised by maladaptive attempts at regulating emotions, and that the development of psychopathology is directly related to these disruptions in normal emotion regulatory processes (e.g., Cole et al., 1994; Gross & Levenson, 1997; Jackson, Malmstadt, Larson, & Davidson, 2000; Mennin et al., 2005). Some researchers have suggested that all psychotherapies, including pharmacotherapy, are aimed at influencing emotion regulation (Bradley, 1990). Hence, clinical models of psychopathology often focus on the problematic aspects of emotion, and assume that awareness and flexible control of emotions are indices of adjustment and, ultimately successful treatment (Bradley, 1990; Greenberg & Safran, 1989).

Dysregulation versus absence of regulation

Cole et al. (1994) stated that the terms dysregulated and unregulated should not be interpreted to mean the same thing. The authors suggested that when individuals engage in extreme or deviant behaviour, it may appear unregulated but that these behaviours still reflect the presence of emotion regulation. Further, they suggested that the term dysregulated is preferable to unregulated because it implies that a normal regulatory process is still operating, but that the manner in which it

operates has serious implications for adjustment.

There are many facets of dysregulation, and to simplify the term to refer only to over-regulation and under-regulation is incorrect (Cole et al., 1994). Cole and colleagues further attempted to explain the complex relationship between regulation and dysregulation by giving the example of dissociation as an affect regulatory strategy for children who experience sexual abuse. Dissociation represents a dysregulated emotional response in that feelings of distress and anxiety (which are an adaptive response to trauma) are overregulated to the point where they no longer may be experienced in response to a threat. Dissociation is adaptive in the sense that it serves a protective function, yet it may restrict memory processes and create a situation in which valuable emotions are then inaccessible in adult life (Cole & Putnam, 1992). Hence, emotions can be seen as regulatory and dysregulatory simultaneously as emotions serve protective and communicative functions while interfering with adaptive development. It is important then to recognise the difficulty that individuals may have in modifying their emotional responding (i.e., by correcting over and/or under regulation) due to the adaptive functions being served.

Affect regulation, self-injury, and impulsive behaviours

There are several psychodynamic theories which have been proposed to explain the reasons why individuals engage in NSSI. The majority of these theories recognise that NSSI assists in the regulation or management of, or escape from negative emotional states (Brown et al., 2002; Chapman, Gratz, & Brown, 2006; Nock & Prinstein, 2004, 2005) and, as such, can be understood in terms of an affect regulation process. Affect regulation has been proposed as one mechanism that

explains links between early childhood experiences, stressful adult experiences and NSSI (Suyemoto & MacDonald, 1995). However, Glassman and colleagues (2007) pointed out that it has not yet been explained why some individuals choose NSSI to achieve affect regulation rather than other behaviours that might serve similar functions, such as binge eating, purging and substance use. The authors speculated that perhaps individuals select NSSI due to the directly self-injurious, punishing nature of this behaviour.

Certainly, the internal experiences of people who engage in NSSI suggest a need to regulate negative affect. Specifically, research has suggested that NSSI assists with the regulation of affect by reducing the anxiety, depression, tension, loneliness and dissociation, as well as feelings of guilt and emptiness that are common experiences for people who self-injure (Bohus et al., 2000; Brown, Lejuez, Kahler, & Strong, 2002; Chapman, Specht, & Cellucci, 2005; Favazza & Conterio, 1989; Kemperman et al., 1997; Walsh & Rosen, 1988). In this way, NSSI can be viewed as a maladaptive coping strategy which is used to manage these symptoms of internal emotional distress (Haines & Williams, 2003; Kleindienst et al., 2008).

In support of the notion that NSSI serves an affect regulatory function, there are three common themes in the literature in relation to theories of affect regulation and self-injury. Firstly, NSSI is considered to be a communication device, used to express overwhelming or intolerable affect to others (Darche, 1990; Raine, 1982). Secondly, it has been suggested that NSSI represents an attempt to regain control over negative emotions, such as anger, by channelling the source of one's affect to an object (Raine, 1982). The third and most consistently expressed view is that NSSI reflects difficulties in managing and regulating affect (Allen, 1995; Bennun, 1984;

Briere & Gil, 1998; Favazza, 1996; Rosen, Walsh, & Rode, 1990). Therefore, NSSI can be conceptualised as behaviour which is negatively reinforced through the process of removing negative emotions to make way for positive, or at least neutral ones (Chapman & Dixon-Gordon, 2007; Kemperman et al., 1997). This will be discussed in more detail in Chapter 5.

There is disagreement in the literature as to whether affect regulation refers to the control of negative emotions, or the control of behaviour when experiencing negative emotions. If one is to equate affect regulation with the control and reduction of negative emotions (e.g., Kopp, 1989; Zeman & Garber, 1996), then this implies that experiencing negative emotions is a sign of emotion dysregulation (Gratz & Tull, 2010). However, the problem with attempting to control negative emotions is that it is often counter-productive and actually increases the frequency, severity and accessibility of these emotions (Hayes et al., 2006). A widespread example of the paradoxical effects of emotional control is Wegner and colleagues' (1987) study in which participants were instructed not to think of a white bear. Within this view, research has emphasised the functionality of controlling one's behaviour (e.g., by inhibiting impulsive behaviour) when experiencing negative emotions, rather than attempting to inhibit the emotion itself (Linehan, 1993). In the context of DBT, this approach utilises strategies such as self-soothing during distress to 'take the edge off' the emotion, rather than escape it.

An alternative approach to affect regulation emphasises the functionality of emotion through awareness, understanding, and, in particular, acceptance of emotions. Rather than try to eliminate emotions entirely, individuals are encouraged to accept the experience of negative emotions (e.g., Gratz & Roemer, 2004). Given

that individuals who engage in NSSI struggle with their emotions, treatments that focus on teaching ways to avoid or control emotions may not be useful (Chapman et al., 2006). Hence, learning to approach and accept emotions in a nonjudgmental way is believed to increase willingness to accept emotions and to decrease secondary emotional reactions (Gratz & Tull, 2010). Several treatments for NSSI provide psychoeducation about the fact that emotions can be used to inform appropriate courses for action for an individual's behaviour. Of course, in treatments which target NSSI through affect regulation (e.g., DBT) individuals are taught to control distress and regulate emotions with varying degrees of distress. These strategies have influence on a broad range of BPD symptoms (Linehan, 1993), including impulsive behaviours.

It is thought that the affect regulatory function of impulsive behaviours such as binge eating and substance use may be similar to NSSI (Miller, 2005). Prospective studies have indicated that increased use of adaptive affect regulation skills (e.g., emotional acceptance) predicts lower levels of negative affect, as well as higher levels of positive affect two weeks later (Berking et al., 2008). In addition, Leahey and colleagues (2008) conducted a ten week mindfulness-based cognitive-behavioural group intervention for binge eating. Participants indicated significant improvements in both binge eating and affect regulation from pre to post treatment.

Similarly, another study found that participation in a brief acceptance and mindfulness based intervention for problematic opioid use increased individuals' skills in emotional acceptance and non-evaluative awareness (Tull et al., 2007). The authors found that treatment reduced users' anxiety and cravings, and improved their affect regulation skills from pre to post treatment.

Finally, Gratz and Gunderson (2006) found further evidence for the usefulness of acceptance and mindfulness based treatments in affect regulation in a 14 week program for women with BPD who engaged in NSSI. Individuals were randomly assigned to either group-based treatment and their current outpatient therapy (group therapy + treatment as usual [TAU]), or to continue with their current outpatient therapy alone for 14 weeks (TAU). Results indicated that there were significant between-group differences on all outcome measures at post-treatment, with the group therapy + TAU condition suggesting significant improvements in functioning for participants. The authors reported that 83% of participants in the group therapy +TAU condition reached normative levels of functioning on emotion dysregulation and experiential avoidance.

These findings build upon the increasing body of literature demonstrating that affect regulation is a clinically-relevant construct that may play an important role in the development and maintenance of NSSI and impulsive behaviours. Despite the importance of targeting affect regulation difficulties within acceptance and mindfulness based interventions, the research in this area is in its earliest stages and requires further exploration.

BPD and self-injury

As mentioned previously, BPD is a disorder that is frequently believed to stem from a fundamental difficulty in regulating affect. Despite the importance of the role of emotional dysregulation in NSSI in individuals with BPD, this has not been investigated very intensively so far (Arntz, 2005). The research has indicated that individuals with BPD can be expected to report generally elevated levels of

dysphoric affect, for example, unusually high levels of negative mood and low levels of positive mood (Watson et al., 1999). If self-injury can be understood as an affect regulation process then it is easy to see how the two are connected.

Within the current DSM-IV-TR (APA, 2000) classification system, BPD is the only psychiatric diagnosis which includes self-injury as a criterion. Specifically, criterion 5 refers to "recurrent suicidal behaviour, gestures, or threats, or self-mutilating behaviour" (p.710). For this reason, it is common to see the two phenomena equated both in research and in clinical practice. Indeed, some authors have considered these behaviours to be a defining characteristic of BPD (Gunderson & Ridolfi, 2001; Soloff et al., 2000), and even suggested that NSSI may be a prodromal sign of BPD (Gunderson & Links, 2008). Estimates from research have indicated that approximately 50 to 75% of individuals with BPD engage in NSSI (Clarkin et al., 1983; Gunderson, 2007; Paris, 2005; Zweig-Frank, Paris, & Guzder, 1994).

Generally speaking, BPD individuals who also engage in NSSI have been found to suffer from more severe symptomatology in comparison to non-self-injuring BPD individuals (Simeon et al., 1992). The frequency of suicide attempts within this population also is considered high, with statistics ranging from 60% to 84% (Black, Blum, Pfohl, & Hale, 2004; Gunderson & Ridolfi, 2001; Soloff et al., 2000; Zanarini et al., 1990, 2006).

Within the self-injuring, BPD population it has been speculated that subtypes of individuals may exist. For example, Russ, Shearin, Clarkin, Harrison, and Hull (1993) claimed that two subtypes of self-injuring Borderline women could be identified according to their reported absence or presence of pain felt during an

incident of self-injury. Women who reported an absence of pain during self-injury were more likely to suffer from high levels of depression, anxiety, dissociation, impulsiveness, trauma symptoms, sexual abuse histories and suicide attempts. In contrast, women who reported that they felt pain during self-injury were a much less homogeneous group, although they were much less likely to have experienced sexual abuse. The mechanisms of a potential relationship between childhood sexual abuse, dissociation, impulsivity and affective symptoms are discussed in more detail in a subsequent section. The presence or absence of BPD in individuals who engage in self-injury has important implications both for research and for treatment. It is possible that individuals with BPD who engage in NSSI represent a distinct homogeneous group, with specific treatment needs and should be considered separately from other self-injuring individuals in the general population.

The role of hyperarousal

Several researchers have postulated that there is a fundamental, biological affective hyperarousal response in individuals with BPD which can be used to explain the origins of their behaviour. In general, the majority of research and clinical observation has cited over stimulation of the autonomic nervous system as the driving mechanism behind the reduced capacity for affect regulation noted in individuals with BPD. This hypothesis suggests that individuals with BPD are autonomically overstimulated and, thus, they feel emotions and physiological sensations much more intensely than people without BPD. This may be consistent with at least two of the DSM-IV-TR (APA, 2000) criteria for BPD including criterion 6 (affective instability) and criterion 8 (intense, inappropriate anger). In order to

cope with stressful situations, BPD individuals require a process of affect regulation to manage these responses. Affective hyperarousal is thought to be of clinical significance because it leads to rapid mood changes and predisposes the individual to engaging in impulsive, self-destructive behaviours (Herpertz et al., 1999). It has been reported that this represents a maladaptive coping strategy used to relieve unbearable, negative emotional states (Linehan, 1993).

Hyperarousal symptoms also are commonly experienced by individuals with PTSD (Foa, 1992; Orr, 1997). When these individuals are exposed to internal or external cues representing their traumatic experience, they demonstrate heightened psychophysiological responses on measures of heart rate, skin conductance, blood pressure and electromyography (EMG) responses than do trauma exposed individuals who do not have PTSD (Orr, 1997). In addition, some individuals with PTSD also demonstrate a hyperarousal response to non-trauma related stressful situations (Peri, Ben-Shakhar, Orr, & Shalev, 2000). These links with PTSD may be of clinical importance, given the proposed relationship with BPD and so called 'complex' PTSD and, more generally, the high proportion of individuals with BPD who have been exposed to trauma.

In terms of the BPD population, researchers have been interested in whether or not these individuals demonstrate intense emotional reactions to specific stressors which are related to a personal context, or whether they are hyperresponsive to emotional stimuli in general (Herpertz et al., 1999). One study, in particular (Herpertz et al., 1999), demonstrated that individuals with BPD are hyperresponsive to emotional stimuli specifically linked to abandonment fears.

Despite this, some researchers have not found evidence of a hyperarousal

response and, instead, have suggested that individuals with BPD may actually experience autonomic underarousal which interferes with their ability to adapt in a flexible way to their environment (Herpertz et al., 1999). However, the researchers noted that this finding needs to be replicated in order to provide further evidence. This theory of under arousal is consistent with DSM-IV-TR (APA, 2000) criterion 7 for BPD which refers to feelings of chronic emptiness. It perhaps is likely that for some individuals with BPD, autonomic under arousal contributes to the tendency to feel 'nothing', hence these individuals may be more likely to engage in sensation seeking experiences (such as those impulsive behaviours identified under criterion 4) in order to produce emotional experiences. Certainly, some researchers have used autonomic under arousal as an explanation for why individuals with BPD engage in self-destructive behaviours (e.g., Herpertz et al., 1999).

Summary

Emotions are an important aspect of human experience, and have a great deal of adaptive value and provide the individual with information about his/her own internal and external environment, contributing to the processes of judgement and decision-making. However, emotions are not always adaptive and, certainly, the way in which the individual manages his/her emotions is linked to the development and maintenance of psychopathology (Bradley, 2000).

Researchers have suggested that there is an important distinction to be made between affect, mood and emotion. Affect is less clearly related to a stimulus, longer lasting and more cognitively complex (Goldsmith, 1994). It also can be used to refer to the behavioural component of emotion (Gross, 1998a), thus it has better

applicability as a term when referring to NSSI and other impulsive behaviours.

A process model of emotion proposed by Gohm (2003) suggests that there are individual differences in emotional clarity, affect intensity and attention to emotions which moderate the overall experience of emotion. In order to use emotions in an adaptive way, the individual needs to be able to define and describe them (Gohm, 2003). Individuals with BPD are likely to lack this skill due to their dichotomous thinking style, and difficulties with alexithymia. Furthermore, an attentional style that allows the individual to keep tabs on the presence of affect is essential for skilful affect regulation. Lastly, the intensity with which one perceives emotion is associated with psychological functioning. For example, individuals who experience affective intensity may be more likely to perceive anxiety symptoms as more intense (Vujanovic et al., 2006) and have negative expectations about their ability to regulate emotions (Flett et al., 1996).

A variety of models have been suggested to explain NSSI, however, affect regulation theory provides a simple explanation which overlaps with a number of constructs including coping, impulsivity, sensation seeking and self-monitoring. From a developmental perspective, the experience of emotion dysregulation is thought to represent a shortcoming in meeting the tasks of emotional development (Cicchetti et al., 1991; Dodge & Garber, 1991). Hence, interference in the processing or affect may involve disruption to attention, interpersonal relationships and social functioning, which are vital symptoms of psychopathology (Cole et al., 1994).

The majority of theories of NSSI recognise that the behaviour assists in the regulation or management of, or escape from negative emotional states (Chapman et al., 2006) and, as such, can be understood in terms of an affect regulation process. In

this way, NSSI can be viewed as a maladaptive coping strategy which is used to manage these symptoms of internal emotional distress (Haines & Williams, 2003; Kleindienst et al., 2008). In addition, the literature frequently identifies the autonomic nervous system as the driving mechanism behind the reduced capacity for affect regulation. In particular, it has been suggested that individuals with BPD are autonomically overstimulated and, thus, they feel emotions and physiological sensations much more intensely than people without BPD. Hence, in order to cope with stressful situations, BPD individuals require a process of affect regulation to manage these responses.

Despite the importance of emotional dysregulation in BPD, this has not been investigated very intensively so far (Arntz, 2005). Furthermore, it appears that the presence or absence of BPD in individuals who engage in self-injury has important implications both for research and for treatment. As mentioned previously, there appears to be an association between individuals with BPD who have a history of NSSI, and premature termination from treatment (Ben-Porath, 2004; Morgan et al., 1976; O'Brien et al., 1986). Hence, it is possible that individuals with BPD who engage in NSSI represent a distinct homogeneous group, with specific treatment needs and should be considered separately from other self-injuring individuals in the general population.

CHAPTER 5

Study 1: Psychological and psychophysiological responses to nonsuicidal self-injury

INTRODUCTION

Researchers have argued that NSSI is a defining characteristic of BPD (Gunderson & Ridolfi, 2001). NSSI occurs in conjunction with a range of other identifiable characteristics in BPD that, in various combinations, interfere with the person's capacity to function (APA, 2000). The problems experienced by people with BPD often are associated with intensely negative psychological states with which these people have few resources to cope (Jovev & Jackson, 2006).

Of course, it is not correct that all people who self-injure can be diagnosed with BPD. Indeed, a recent study examining different types of self-injurious behaviour was able to demonstrate that the majority of people who self-injure do not present with borderline characteristics (Klonsky & Olino, 2008). Certainly, the majority of research has not specifically targeted NSSI in people with BPD but has focused on NSSI in general.

Considerable research attention has been given to the delineation of the motivational and emotional factors associated with NSSI. Although a multitude of theories to account for the behaviour have been proposed (see Suyemoto, 1998), most recognise that NSSI assists in the regulation of negative affect (Chapman et al., 2006). Specifically, the research literature has suggested that NSSI is a maladaptive coping strategy (Haines & Williams, 2003; Kleindienst et al., 2008) that is used by the individual to assist with the regulation of the consequences of experiences such as anxiety, depression, tension, loneliness and dissociation as well as feelings of guilt and emptiness (e.g., Bohus et al., 2000; Chapman et al., 2005; Kemperman et al., 1997).

There has been consistent indication in the literature that the individual's

emotional state preceding NSSI is negative and that following NSSI, these negative emotional states end (e.g., Bennun, 1984; Haines, Williams & Brain, 1995; Klonsky, 2007). In this way, NSSI is a behaviour that is negatively reinforced by serving to reduce negative affect to make way for neutral or positive states (Chapman & Dixon-Gordon, 2007; Kemperman et al., 1997). Although it is possible to use self-report methods of assessing individuals' emotional states before, during and after engaging in behaviour, an examination of their psychophysiological responses may be preferable, as this provides a more accurate assessment of peripheral sympathetic nervous system activity (Haines, Williams, Brain, & Wilson, 1995).

The psychophysiology of NSSI

Psychophysiology is an important component of behaviour, yet it is often a neglected area in research due to the practical and ethical components associated with its assessment. Psychophysiological variables such as heart rate reflect activity in the peripheral sympathetic nervous system. To measure psychophysiological reactions throughout the duration of a clinically significant behaviour or event, as it was happening, clearly would be impossible (Haines, Williams, Brain, & Wilson, 1995). However, psychophysiological responses that are emitted during an individual's recollection of a particular event simulate those that are experienced during the actual execution of the event (Lang, 1979). This provides an avenue for assessing psychophysiological states.

One of the major advantages of measuring psychophysiological responses is that they provide a more objective means of studying clinical phenomenology. Essentially, such measurement allows the researcher to stimulate symptoms that may

be present in the individual such as those associated with trauma (Schmahl et al., 2004).

Using a guided imagery script in combination with the measurement of sympathetic nervous system activity is a technique which has been used extensively to examine trauma responding (e.g., Blanchard & Buckley, 1999; Pitman, Orr, Forgue, de Jong, & Claiborn, 1987; Pitman et al., 2001; Prins, Kaloupek, & Keane, 1995). For example, research has been able to demonstrate that in combat veterans with and without PTSD, participants who heard personalised scripts of their traumatic experiences demonstrated an increase in heart rate (Pitman et al., 1987, 2001). Additional studies also have demonstrated the benefit of using guided imagery to assess the psychophysiological processes underlying a range of clinical behaviours such as nail-biting, binge eating, and homicide (Haines, Williams, Sale, Glading, & Davidson, 2002; Wells et al., 1998; Williams, Haines, & Brain, 1995; Williams, Haines, Johnson-Glading, Davidson, & Sale, 2006).

Guided imagery also has been validated through various empirical studies as an established method for assessing psychophysiological states (Borkovec & Hu, 1990; Brain, 1998; Cook, Melamed, Cuthbert, McNeil, & Lang, 1988; Lang, 1979; Orr, Pitman, Lasko, & Herz, 1993; Pitman et al., 1987; Watkins, Clum, Borden, Broyles, & Hayes, 1990). However, the usefulness of this technique with certain clinical behaviours is not without criticism. For example, some trauma researchers have suggested that the assessment of peritraumatic responses, the individual's response at the time of the event, relies too heavily on retrospective recall (Zoellner, Sacks, & Foa, 2001). It also was suggested that memory for the general emotional (e.g., feelings of anger, helplessness and humiliation) and dissociative intensity of an

experience fluctuates over time. Despite this claim, there is evidence from research on flashbulb memories (i.e., highly detailed recollections of a specific event) which suggests that this is not necessarily always the case. For example, in a study of flashbulb memories for the assassination attempt on Ronald Reagan, Pillemer (1984) demonstrated that these memories remained consistent over a six month interval following the attempted assassination. Furthermore, it was found that stronger emotional reactions to the event were associated with greater consistency of narrative and visual memories.

Generally speaking, individuals will demonstrate increased arousal in response to reminders of a stressful event. For example, Orr and colleagues (1998) found that sexually abused women with PTSD, relative to sexually abused women without PTSD, demonstrated heightened psychophysiologic responses during personal sexual abuse imagery but not during imagery of stressful, non-abuse related experiences. In addition, compared to neutral, consensual sex and enjoyable imagery scripts, exposure to sexual abuse imagery in sexually abused women resulted in elevated psychophysiological responses (McDonagh-Coyle et al., 2001). It also has been found that individuals diagnosed with stage one to four breast cancer who also had PTSD showed significantly elevated psychophysiological response during imagery of their personal breast cancer experiences compared with patients who no longer had or had never had PTSD (Pitman et al., 2001).

The tension reduction response

Recollections of acts of NSSI could be classified as stressful. However, in contrast to other stressful experiences, individuals who engage in NSSI do not

generally demonstrate this same pattern of increased arousal during recollection. Instead, the tension-relieving role of NSSI has been demonstrated (e.g., Brain et al., 1998a, 1998b, 2002; Favazza & Simeon, 1995; Haines, Williams, Brain et al., 1995). That is, it has been well documented that individuals who engage in NSSI often feel an escalation of tension, depression, anger, anxiety and distress prior to engaging in the act (Feldman, 1988a; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972; Simpson, 1976). Subsequently, feelings of relaxation, calm and pleasure often follow the act (Brain et al., 1998a, 1998b; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Lion & Conn, 1982; Pao, 1969; Rosenthal et al., 1972; Simpson, 1976; van Moffaert, 1990). These feelings, however, are usually short-lived and a re-escalation of negative consequential emotion occurs including a sense of guilt, regret and general 'badness' (Feldman, 1988a; Lion & Conn, 1982; Schwartz et al., 1989). It is likely that these tension reducing qualities of NSSI serve to reinforce the behaviour and thereby increasing the likelihood of repetition (Bennun, 1984; Favazza & Conterio, 1989).

There has been consistent demonstration of tension reduction with self-injury in community, forensic and clinical samples (Brain et al., 1998a, 2002; Haines & George, 2008; Haines, Williams, Brain, & Wilson, 1995). This would fit with the notion that affect regulation is a process of ending negative psychological states and replacing them with a sense of calm and quiescence.

Psychophysiological studies using individuals with BPD

The first study of psychophysiological correlates of BPD was conducted by Herpertz et al. (1999). That study compared responses of 24 female patients with

BPD and 27 control subjects. Participants were shown a set of photographs with pleasant, neutral or unpleasant emotional stimuli. Physiological reactions were measured from heart rate, skin conductance and startle response. The patients with BPD did not demonstrate higher levels of startle amplitude during the presentation of unpleasant images, as expected by the researchers. In addition, there were no differences in skin conductance or heart rate levels between BPD and control subjects. It was speculated that the unpleasant images simply were not salient reminders of trauma for the individuals with BPD. It is also worth noting that these images were not personalised for the participants, hence this may have contributed to reduced emotional responding.

A study by Schmahl and colleagues (2004) attempted to develop stimuli that would be more salient for emotional responding in BPD. The authors examined the role of feelings of abandonment as a core element of BPD presentation by comparing participants with BPD, PTSD and participants without any psychiatric disorder. All participants had a history of sexual and/or physical abuse. The authors speculated that individuals with PTSD would show greater psychophysiological reactivity in response to a traumatic abuse script than to an abandonment script, whereas individuals with BPD would demonstrate greater reactivity to an abandonment script than to a traumatic abuse script.

Participants were administered a personalised trauma script, abandonment script and a neutral script using established methods (Bremner et al., 1999; Pitman et al., 1987). Physiological recordings of heart rate, skin conductance and blood pressure were taken, and participants provided ratings of subjective units of distress (SUDS) using a 100mm visual analogue scale (VAS). There were no significant

differences in psychological ratings (e.g., VAS) between the two groups. There were also no significant script, diagnosis or script by diagnosis effects for heart rate, skin conductance or diastolic blood pressure. However, there was a significant script by diagnosis interaction for systolic blood pressure whereby participants with PTSD demonstrated higher systolic blood pressure in response to traumatic and abandonment scripts relative to neutral scripts. This suggested that individuals with BPD demonstrated an absence of physiological responding to personalised, stress-inducing stimuli.

It appears then, that there is an unresolved debate as to whether or not individuals with BPD actually demonstrate physiological responsiveness to stressors, given that the literature described these individuals as demonstrating hyperarousal in response to emotional stressors (e.g., Linehan, 1993). In laboratory settings, a hyperarousal response to stressful stimuli in individuals with BPD has not clearly been demonstrated (Herpertz et al., 1999, 2001; Schmahl et al., 2004). One reason for this may be the high degree of dissociative symptoms in BPD, which could explain a lower awareness of script content and, hence, an absence of physiological arousal during stress (Schmahl et al., 2004). Certainly, in the Schmal et al. (2004) study, BPD participants obtained higher scores for dissociation on the Dissociative Experiences Scale (Bernstein & Putnam, 1986) than the other groups. Williams, Haines, and Sale (2003) investigated the psychophysiology of Dissociative Identity Disorder (DID), and suggested that dissociative episodes were associated with a reduction in psychophysiological arousal. The authors concluded that the experience of dissociation served to protect the individual in times of severe stress.

Process of guided imagery

In order to assess psychophysiological reactions to various behaviours, several studies have used similar script-driven guided imagery techniques (e.g., Orr et al., 1998; Pitman et al., 1987; Shalev, Peri, Gelpin, Orr, & Pitman, 1997). This method of assessment was originally developed by Lang and colleagues in order to examine fear responses (Lang, Kozak, Miller, & Levin, 1980). Additionally, it has been shown that imagery which is personally relevant, rather than general, is able to elicit more realistic psychophysiological responses. A personalised and staged guided imagery methodology has been successfully developed and used to determine the psychophysiological processes associated with various anxiety disorders and anxiety-related behaviours including NSSI (Brain et al., 1998a, 1998b, 2002; Haines, Williams, Brain, & Wilson, 1995), nail biting (Wells, Haines, & Williams, 1998; Wells et al., 1999), eating disorders (Williams, Haines, & Brain, 1995) and OCD (Haines, Josephs, Williams, & Wells, 1998). Additionally, a four-stage guided imagery methodology enables an accurate assessment of psychophysiological responses to behaviours normally difficult to assess experimentally (Haines, Williams, Brain, & Wilson, 1995).

Using a stage-by-stage approach to the presentation of guided imagery information has been demonstrated to accurately chart arousal changes associated with a specific behaviour as it develops over time (Brain et al., 1998a, 1998b; Haines, Williams, & Brain, 1995; Williams, Haines, & Brain, 1995). The psychophysiological reinforcing mechanisms of NSSI have been determined in this way (Haines, Williams, Brain, & Wilson, 1995). For example, in a study of prisoners who engage in NSSI, Haines, Williams, and Brain (1995) demonstrated that a

significant decrease in psychophysiological arousal when the actual act of injury was being imaged was evident. The benefits of using subjective and objective means of measuring an individual's response were also evident. That is, although there was a clear decrease in psychophysiological response, participants did not report a decrease in emotional response until after the act of NSSI was complete. Hence, participants consistently reported negative feelings, despite a reduction in their level of psychophysiological arousal. Psychophysiological assessment, therefore, has merit as an assessment tool because changes in psychophysiological arousal may operate to reinforce and maintain SIB, not the psychological response (Haines, Williams, Brain, & Wilson, 1995).

Tension reduction in individuals with and without BPD

It has not yet been determined that the processes associated with NSSI are the same for self-injuring individuals with and without borderline personality characteristics. There is mixed evidence concerning physiological reactivity in individuals with BPD during imagery of NSSI (Groschwitz & Plener, 2012). The existence of affect dysregulation and hyperarousal theories of BPD (Goodman, Triebwasser, & New, 2008; Reinecke & Ehrenreich, 2005) would lead to strong speculation that individuals with BPD would experience a heightened autonomic response to stressful experiences that would require a process of affect regulation to manage these responses. Therefore, it could be supposed that NSSI serves the same function of affect regulation for those with BPD as it does for those without the disorder.

There is support for this notion. NSSI in people with BPD has been

suggested to be a dysfunctional strategy that is used to regulate the intense emotional states that characterise the disorder (Kleindienst et al., 2008). Certainly, examination of emotional states immediately before and immediately after self-injury in a BPD sample demonstrated a cessation of the preceding negative emotional states and a replacement with a sense of relief or other positive psychological states (Chapman & Dixon-Gordon, 2007). A decrease in nocturnal cortisol following self-injury and an increase prior to the next episode of self-injury in a woman with BPD also supports the affect regulatory function of NSSI (Sachsse, von der Heyse, & Heuther, 2002).

However, there are contradictory research findings that have indicated that the typical tension reduction response to NSSI may not be evident in self-injuring individuals with BPD. For example, one study, using the personalised, staged guided imagery methodology developed by Haines, Williams, Brain and colleagues (1995) investigated evidence for escape conditioning in people with BPD who engaged in NSSI using respiratory sinus arrhythmia and skin conductance response (Shaw-Welch et al., 2008). Evidence of a decrease in negative emotional state or tension reduction during the act of self-injury was not found.

It is the case that others have noted some characteristics of borderline self-injury that do not fit with a tension reduction model of NSSI. For example, it was determined that at least some individuals with BPD "get a kick" out of NSSI (Kleindienst et al., 2008, p.230), suggesting an arousal increase with the act of self-injury. Others have expressed a similar view. For example, it has been suggested that some individuals with BPD find self-injury elicits feelings of excitement and euphoria and that these individual are reported to 'experience a high' while self-injuring (Kemperman et al., 1997; Kreisman & Straus, 2004). Authors such as Osuch

et al. (1999) and Favazza (2011) also have identified self-stimulation (e.g., to provide excitement or a 'high'), euphoria and thrill-seeking as motivating factors for engaging in NSSI. Additionally, Selekman (2009) described some individuals who engage in NSSI as "getting a rush effect" (p. 2) or "legal high" (p. 9) from the behaviour. In one study comparing NSSI with attempted suicide in female inmates, 12% (n = 63) of participants reported that they felt 'boredom' prior to engaging in NSSI (Chapman & Dixon-Gordon, 2007). Similarly, it has been suggested that individuals with BPD may have an orientation approach toward novel stimuli. In this case, engaging in NSSI may reflect the BPD individual's pursuit of pleasure or 'thrills', rather than the tension reduction and avoidance motives that have been proposed to underlie self-injury in BPD (Chapman et al., 2009).

Summary

Previously, it has been assumed that there are little, if any, clinically significant differences between individuals with and without BPD who engage in NSSI, at least in terms of their self-injurious behaviour. However, the majority of research in the area has relied solely on self-report methods of assessing emotions associated with NSSI. This is perhaps an important oversight given the consistent evidence that individuals with BPD experience difficulties with alexithymia (Zlotnick, Mattia, & Zimmerman, 2001). In addition, few studies have actually measured NSSI in BPD by using a control group of non-borderline individuals who also engage in the behaviour.

There is evidence to indicate that the positive or pleasurable effects associated with tension reduction in NSSI are not necessarily consistent with self-

soothing or provide a calming effect for all individuals who engage in the behaviour. Rather, the research needs to consider the wider range of possible pleasurable emotions associated with a positive affective state such as excitement, elation, ecstasy and so on. Gross (1999) suggested that it is incorrect to limit affect regulation theory only to a reduction in negative affect. He suggested that theories of affect regulation should encompass increase, decrease and maintenance of negative and positive affect. It seems important to give consideration to this point when conducting research investigating NSSI, as it may be the case that the affect regulatory process for those with and without BPD is different.

Aims and hypotheses

The aim of the study is to further examine the psychological and psychophysiological responses to NSSI of self-injuring individuals with and without BPD. The study will use a personalised, staged guided imagery methodology to elicit responses to NSSI and will test the affect regulation theory of NSSI. Comparisons will be made between the responses to NSSI and control events associated with accidental injury and an emotionally neutral activity. It is expected that:

1. Individuals with BPD will demonstrate an increase in psychophysiological arousal during the incident stage of the NSSI imagery script. In contrast, individuals without BPD will demonstrate a decrease in arousal during the incident stage of NSSI imagery script;
2. Both individuals with and without BPD will demonstrate a reduction in negative emotional states with the act of NSSI during the incident and

consequence stages of the imagery script;

3. Individuals with BPD will report an increase in high arousal positive emotional states, such as excitement, with the act of NSSI during the incident stage of the imagery script whereas individuals without BPD will report an increase in low arousal positive emotional states during the incident stage of the imagery script;
4. The affect regulation function, either positive or negative, will distinguish NSSI from control events of accidental injury and an emotionally neutral event. That is,
    a. The NSSI script will be associated with higher levels of arousal than the accidental injury and neutral scripts for both BPD and NBPD groups;
    b. The accidental injury script will be associated with higher levels of arousal, and higher ratings of negative emotions than the neutral script;
    c. The neutral script will not elicit any significant increase or decrease in arousal at any stage of the script for either group, nor will it elicit an increase or decrease in negative or positive emotions.

METHOD

Participants

Initially, a total of 63 participants took part in the study. However, three participants' data sets were removed from the sample. One participant was excluded

from all analyses due to the determination by the researcher that the nature of the participant's self-injury was suicidal rather than non-suicidal. One participant completed the interview and returned questionnaires but moved interstate before the second laboratory session could be conducted, so there was no psychophysiological data available from this participant. Another participant withdrew from university studies before the second laboratory session took place, and did not return any questionnaires. The remaining 60 participants were used in this study.

All participants (N = 60) reported a history of NSSI and had engaged in NSSI within at least the last 12 months. All participants identified that they had engaged in self-cutting at some stage, and this was the most common NSSI behaviour endorsed in this study. The majority of participants identified self-cutting as their primary or only method of NSSI (n = 58). However, there were two participants who said that they engaged in self-cutting and self-burning equally. To ensure consistency in reporting, participants were asked to consider their reactions to self-cutting only when completing the current research.

Participants were divided into two groups on the basis of the presence of symptoms and behaviours of significant strength to meet the diagnostic criteria for BPD; BPD group (n = 30) and NBPD group (n = 30). The group allocation was confirmed using the Structured Clinical Interview for DSM-IV (APA, 1994) Axis II Personality Disorders (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997), which uses a two-tiered system. Participants firstly completed the self-report questions relevant to BPD. These questions use a Yes/No response format, and in cases where items are endorsed by the participant, the corresponding portions of the SCID-II interview are then administered in order to assign a diagnosis. Each BPD

criterion is rated as either *?*, *1*, *2*, or *3*. The question mark is used when the interviewer is uncertain how to code an item. A rating of 1 is used when the symptom described is clearly absent, a rating of 2 is used when the threshold for the criteria is almost met, and 3 is used when the threshold is met (e.g., participant acknowledges the trait and describes convincing examples, First et al., 1997). When an individual obtains 5 criteria that have been rated as meeting threshold (*3*), then this individual may be considered to be demonstrating the characteristics of BPD (First et al., 1997). Conversely, individuals who obtained less than 5 of the threshold items for BPD were considered to be NBPD. This means that an individual can obtain four ratings of *3* on the SCID-II before s/he is considered to have BPD.

Certainly, the authors of other diagnostic tools such as the Diagnostic Interview for DSM-IV-TR (APA, 2000) Personality Disorders, DIPD; Zanarini, Frankenburg, Sickel, & Yong, 1996) suggest that individuals without BPD should meet less than two of the DSM-IV diagnostic criteria for the disorder. However, consideration must be given to the fact that the current study consisted entirely of individuals who engage in NSSI, meaning that a score of zero for BPD on the SCID-II would not be possible for either group. In addition, the research consistently indicates that individuals who engage in NSSI experience difficulties with affect regulation (e.g., depression, Glassman et al., 2007) and impulsivity (Hawton et al., 1999; Herpertz et al., 1997). Taking these factors into consideration, it is then likely that all participants would meet at least one or two of the diagnostic criteria for BPD.

Participants were undergraduate university students who were currently enrolled in Psychology units. They were recruited through advertisement on the School of Psychology website and the school noticeboard. A more in depth

description of the sample is presented in the results section, but the percentage of individuals with BPD, even in this small sample of first year psychology students, is noteworthy. It is also of interest that the majority of participants tended to present for research in the first 6 weeks of semester but withdrew from university shortly before payment for enrolment was required, and right before their first assignments would be due. This observation may add to the suggestion by Zanarini, Frankenburg, Hennen, Reich, and Silk, (2004) that most individuals with BPD can function relatively well in the community, attending school and work until a particular stressor causes their overall functioning to rapidly decline.

Materials

Demographic information and sample characteristics

Participants were given a demographics questionnaire (see Appendix B) asking about their age, sex, educational history, marital status and information about the frequency and duration of NSSI. This questionnaire also asked if participants had ever tried to commit suicide, and/or if they had experienced any recent suicidal thoughts. Additionally, participants were interviewed regarding the frequency and duration of their NSSI behaviour and the method used. Participants also were asked if they were currently seeking help for NSSI from a psychologist, counsellor or psychiatrist, and how long it took before they sought help. In the interests of determining diagnoses other than BPD, participants were also asked if they were seeing one of these health professionals for a reason other than NSSI.

The potential impacts of participants' taking medication or using substances was considered, however, given the nature of the target population it would be

unrealistic to obtain a sample who were medication-free. Similarly, it would be difficult to obtain a sample of individuals with BPD who did not meet the criteria from additional Axis I or Axis II disorders. Indeed, it has been suggested that research using participants who have BPD who do not take any medication and who do not have additional diagnoses would likely have poor external validity (e.g., Donegan et al., 2003; Rosenthal et al., 2008; Schmahl & Bremner 2006). For these reasons, participants who were taking medications or who may have had additional diagnoses were included in the sample.

Psychological tests

Assessment of BPD

The SCID-II (First et al., 1997) is a 120-item semi-structured interview which assesses for all DSM-IV-TR (APA, 2000) personality disorders. In the current study, only the BPD items were administered because of the time demand on participants. There are 15 questions which assess BPD, beginning at question 90 and ending at question 104. In the SCID-II, each DSM-IV (APA, 1994) personality disorder item is scored on a three-point scale (1 = absent, 2 = subthreshold or 3 = present). As mentioned previously, a score of three on at least five out of nine BPD items is required for a diagnosis of BPD. The SCID-II has been used extensively throughout the research literature as a means of identifying participants who can be classified as BPD (e.g., Benazzi, 2008; Korzekwa, Dell, Links, Thabane, & Webb, 2008; Melartin, Hakkinen, Koiviston, Suominen & Isometsa, 2009; Schmahl et al., 2004).

Interviewer drift was prevented by presenting the participant with the relevant (BPD) personality questionnaire items, and using this during the interview portion as

a focus if interview content drifted from the specific question at hand. Additionally, the entire interview session (which included the explanation of informed consent, SCID-II assessment, imagery interviews and collection of demographic information) was limited to maximum of 90 minutes.

Although the SCID-II was not designed as a stand-alone instrument, Ball, Rounsaville, Tennen, and Kranzler (2001) found internal consistency of SCID-II rated personality disorders in a population to be above 0.6 (the lowest acceptable value) (range .35 to .80) for all disorders except Schizoid Personality Disorder. Maffei and colleagues (1997) found that the SCID-II possesses adequate interrater reliability for both categorical and dimensional personality disorder evaluations.

It is recognised that DSM-V will incorporate a number of dimensional factors for the classification of BPD (Skodol et al., 2011a, 2011b; Tyrer, 2011). However, the current research maintains the traditional categorical approach of DSM-IV-TR (APA, 2000).

Interrater reliability was not affected by inpatient or outpatient status or the presence or absence of an Axis I diagnosis. Both SCID-II diagnoses and the SCID-II items had adequate interrater reliability. Of the SCID-II items, 98.6% showed values in the moderate-to-excellent range (with .901 the lowest, and .982 the highest). The measure also demonstrated satisfactory internal consistency, with no significant differences between interviewers and observers. For BPD in particular, the correlation coefficient was .85.

Suicidal intent

The Intent Score Scale (Pierce, 1977) was used in order to establish that there

was, in fact an absence of suicidal intent associated with acts of self-injury in each of the three studies. The ISS was considered a more adequate measure for establishing an absence of suicidal intent than some of the available self-injury measures. This is because the ISS allows the interviewer to carefully establish information about the circumstances of the act of self-injury, the individual's self-reported motivations and it also provides an assessment of risk. These combinations of factors allow an examiner to determine if an act of self-injury is likely to be suicidal, nonsuicidal or parasuicidal. The ISS is a 12 item rating scale containing three sections. These categories refer to the circumstances surrounding the attempt (circumstances), self-reported suicidal intent (self-report), and risk to life (risk). The range of possible scores is from 0 to 25, with a higher score indicating a greater degree of suicidal intent. Scores of 0 to 3 are classified as low intent, 4 to 10 medium intent and 11 to 25 indicating a high degree of intent (Pierce, 1981). The ISS also contains an item which assesses the impulsiveness of the act. Participants can answer that the act was impulsive with no premeditation, was contemplated for less than one day, or was contemplated for more than one day.

The ISS is a modified version of the Suicidal Intent Scale (SIS; Beck, Schuyler, & Herman, 1974). The ISS was modified to contain a more objective means of assessing suicidal intent after finding that patients with low intent tended to enhance the social desirability of their act by exaggerating a wish to die (Hamdi, Amin, & Matar, 1991).

The ISS has been demonstrated to be a reliable and valid measure of suicidal intent. Inter-rater reliability has been demonstrated for two independent raters (r = .97), and when both a patient and their close relative completed the circumstances

section (r = .82). Test-retest reliability has been demonstrated for a sample of patients interviewed after a suicide attempt and reinterviewed after one week without any significant change in their score. Satisfactory item-total correlations have also been demonstrated. Predictive validity of the ISS has been demonstrated for those scoring in the low range of suicidal intent, with none completing suicide at their next attempt. Predictive validity was also demonstrated for those patients who consistently scored in the high range, which tended to be associated with repeated attempts over time. Five year follow-up of 500 suicidal patients indicated that those patients who completed suicides (n = 7) tended to have score in the high range (Pierce, 1981). Of course, the analysis was hampered by the low number of eventual suicides. However, it was determined that repeated administration of the scale over a substantial time span can track the fluctuation in lethality and intent in self-destructive behaviour.

Imagery Scripts

Imagery scripts were developed in relation to an episode of NSSI experienced by each participant, an experience of accidental injury (e.g., accident with a kitchen knife), and an emotionally neutral and low arousal event (e.g., making a cup of coffee). Separate scripts detailing information relevant to the individual were written for each participant. Scripts detailed events that individuals had actually experienced, and as much as possible used their exact wording of descriptions of their thoughts and feelings. In this way, participants were not directed to experience reactions they had not previously recalled (Haines, Williams, Brain, & Wilson, 1995).

All participants were asked to discuss the information for the personalised

imagery scripts in terms of the environment in which the behaviour occurred, their behaviour, and their emotional, cognitive and psychophysiological reactions. Each script was divided into four stages: setting the scene (describing the situation in which the event occurred and the precipitants), approach (the moments immediately before the targeted behaviour), incident (the actual targeted behaviour) and consequence (the moments immediately after the targeted behaviour). These scripts represented a continuous sequence of events. An example of each script is depicted in Appendix J.

Visual Analogue Scales (VAS)

Visual Analogue Scales (VAS) (McCormack, de Horne, & Sheather, 1988) were used to measure the individual's psychological responses to the three target events (see Appendix C). VAS scores (from 0 to 100) represented this response on nine bipolar dimensions, including anger, unhappiness, fear, anxiety and tension; dissociative responses included numbness (depersonalisation) and unreality (derealisation); and suicidal risk variables included risk to life and perceived control. A higher score on these dimensions represented a more negative experience. An examination of participants' specific experiences of anger, unhappiness, and sense of perceived control using additional measures will be presented in Study 3. Additional measures for experiences such as anxiety and dissociation were not included since these items were not a central part of the research question.

VAS were also used to assess accuracy of script content and clarity of imagery as a means of controlling for these variables. Higher scores on these dimensions represented a more positive experience. McCormack and colleagues

(1988) have suggested that VAS may be particular useful in the assessment of individual differences in between-subjects design research.

Apparatus and psychophysiological recording

Measurement of psychophysiological responses was facilitated using Chart 3.4 software on a PC linked to a Powerlab/8S data acquisition system. Recordings were made at 1mm/s-1, with a sampling speed of 200 sample/s-1.

Measurements were taken for electrocardiograph (ECG) which was used to obtain a mean heart rate (HR). Data for heart rate were recorded using 7mm Ag/AgCI electrodes, one placed on each side of the ribcage along the lateral line with an earth on the mastoid process. Heart rate was chosen as it is a reliable measure of sympathetic nervous system activation (Hersen, 2006). Recent studies in the area have utilised methods such as respiratory sinus arrhythmia (RSA), claiming that this is a more sophisticated method (e.g., Shaw-Welch et al., 2008). However, it needs to be taken into consideration that RSA is primarily designed to measure parasympathetic rather than sympathetic nervous system activity, and results need to be regarded with caution as RSA requires participants to carefully control their breathing (Berntson et al., 1997; Blain, Meste, & Bermon, 2005). This means that RSA is sensitive to respiration rate and large changes in respiration may produce false results (Berntson et al., 1997). Some researchers have found that RSA is less affected if participants are seated rather than standing (Kageyama, Imai, & Kabuto, 1996), and others have used a paced breathing task to try and reduce the impact of inhalation rates (e.g., Hirsch & Bishop, 1981). In situations where individuals are distressed, it is perhaps likely that controlling one's breathing would be difficult.

Hence, RSA may be a less than ideal method for measuring responses to NSSI.

Certainly, heart rate variability is affected by respiration, but the affect is most likely to be noticed during deep breathing (Shields, 2009). Heart rate has been used extensively in research into posttraumatic stress as the most reliable measure of arousal (e.g., Buckley & Kaloupek, 2001; Keane et al., 1998; Lindauer et al., 2006; Orr et al., 1993; Orr, 1997; Orr et al., 1998; Peri et al., 2000; Pitman et al., 1987; Pitman et al., 2001; Shalev & Rogel-Fuchs, 1993).

Similarly, other studies have used skin conductance response (SCR) to measure whether engaging in impulsive behaviours depends on high emotional states (e.g., Chapman et al., 2010). It has been noted, however, that SCR also can be susceptible to interference and that there is often a delay of 1-4 seconds in response after the stimulus has been presented (e.g., Hugdahl, 1998). This delay in response has been noted in previous studies of NSSI using a staged, guided imagery methodology (e.g., Wells et al., 1999), and SCR has been determined to be vulnerable to factors such as imagery ability (Lang, Levin, Miller, & Kozak, 1983).

Procedure

Session one: Interview

In an initial session, the investigator explained the nature of the research prior to obtaining verbal and written informed consent (see Appendix A). Participants were firstly asked to briefly describe the nature of their NSSI to confirm that (a) the incident, in fact, was non-suicidal in nature, and that (b) it met with the current literature's definition of direct NSSI. Participants then were interviewed using the SCID-II (First et al., 1997) to determine their BPD status. Each SCID-II was

administered by the author, who is a registered, currently practising clinical psychologist. In addition, regular case discussion and cross-checking of SCID-II profiles with the primary supervisor for this project occurred as part of a process of reducing bias and conceptualising any ambiguous presentations.

At no stage were participants made aware that they were being screened for BPD. Given that the current study used a student population, and these individuals may not have been presenting for treatment it was felt that it would be inappropriate in this particular context to share this information. Rather, the researcher explained that there have been a range of symptoms and behaviours that appear common to individuals who engage in NSSI identified in the research literature and that a brief check list and interview would be administered in order to investigate the presence or absence of these factors. Participants were informed that some items may be like or unlike their experiences. The SCID-II contains items that ask about NSSI, mood and suicide, which would be familiar to individuals who engage in NSSI regardless of BPD status. For example, question 97 asks "have you ever tried to hurt or kill yourself or threatened to do so?", and question 98 asks "have you ever cut, burned or scratched yourself on purpose?". Similarly, question 96 asks "have you ever done things impulsively?", and question 99 asks "do you have lots of sudden mood changes?".

Participants were then interviewed to collect details for the imagery scripts. At the end of each interview, the investigator briefly assessed the participant's level of distress before leaving the laboratory, and provided support and referral information for those who expressed an interest in receiving psychological assistance with NSSI. Imagery scripts were constructed by the experimenter in the intervening

period between the interview and the laboratory session.

Session 2: Psychophysiological recording and psychological responses

During a second session, electrodes were applied and the imagery scripts were verbally administered by the experimenter to each participant. Each script was read in vivo to the participant. Participants were asked to keep their eyes closed during imagery presentation and to concentrate on imaging details currently being described. Following baseline, each stage of the four stage imagery script was presented. Each stage was approximately 60 seconds in duration. There was a 10 second pause between stages at which time participants were asked to open their eyes. This between stages pause was kept brief to allow for continuity of imagery. Scripts were presented in a counterbalanced order to prevent adaptation-habituation.

After the presentation of each script, participants completed VASs, rating their subjective responses to each stage of that script. Prior to rating, the experimenter reminded participants of key elements in the stage in order to ensure that participants could remember what occurred in each stage, and there was no confusion between stages.

Each step of the procedure was carefully explained before it occurred, and participants' understanding of what was required was checked at regular intervals where appropriate. Participants were debriefed after the conclusion of the recording session, and again support and referral sources were made available where necessary. The study and its procedures were approved by the Human Research Ethics Committee at the University of Tasmania.

Transformation and scoring of psychophysiological data

Mean psychophysiological responses were calculated for heart rate. Scores were extracted for a 30 second pre-imagery baseline recording and for a 30 second period of each stage of each imagery script. This scoring period was taken 15-20 seconds into each stage and was based on script content. This scoring method has been used successfully in previous research (Brain et al., 1998a, 1998b, 2002; Driscoll et al., 1997; Haines et al., 1995).

RESULTS

Description of sample

Consideration was given to demographic and NSSI related information. Participants' ages ranged from 18 to 47. For the BPD group the mean age was 21.1 years (*SD* = 5.0) and for the NBPD group, the mean age was 25.7 years (*SD* = 8.4). There were 49 females and 11 males who participated in this study. Comparisons between groups with regard to demographic data are presented in Table 2. There were no significant differences between the groups on factors such as age or education level.

Table 2

Sample characteristics of Borderline and non-Borderline individuals engaging in NSSI.

Variable	Level		Group BPD	Group NBPD	Analysis
Sex	Female	%	90	73.4	χ^2 (2,N = 60) = .2.8, p>.05
Age		M	21.1	25.7	t(58) = 2.6, p>.05
		SD	5.0	8.4	
SCID-II score[a]		M	6.4	2.4	t(58) = 14.9, p = .0001
		SD	1.0	1.1	
Marital status	Single	%	79.3	55.2	χ^2 (2,N = 60) = .3.3, p>.05
	Married		20.7	34.5	
	Sep/divorce		0	10.3	
Education level	University	%	7.1	14.3	χ^2 (3,N = 55) = .4.7, p>.05
	Year 12		2.1	60.7	
	TAFE		10.7	14.3	
	Highschool		0	10.7	

[a] Structured Clinical Interview for DSM-IV (APA, 1994) Axis II Disorders

It was also considered important to examine potential differences between BPD and NBPD individuals in terms of frequency and duration of NSSI, as well as factors such as previous suicide attempts and help-seeking behaviours. These results are presented in Table 3. Again, there were no significant differences between the two groups on any of these factors. A more in depth consideration of psychiatric symptoms and potential comorbidity is discussed in Study 3.

Table 3

Descriptive factors associated with NSSI for Borderline and Non-Borderline groups.

Variable	Level		Group BPD	Group NBPD	Analysis
Freq. of NSSI	Daily	%	3.4	7.1	χ^2 (4, N = 57) = 2.8, *p*>.05
	Weekly		27.6	17.9	
	Fortnightly		6.9	17.9	
	Monthly		6.9	10.7	
	Yearly or <		55.2	46.4	
Dur. of NSSI	Years	<1	7.1	22.2	χ^2 (2, N = 55) = 4.1, *p*>.05
		2-5	57.1	33.3	
		5>	57.1	44.4	
No. of injuries	<5	%	3.3	13.8	χ^2 (3, N = 59) = 3.0, *p*>.05
	<50		50	37.9	
	<100		23.3	31.0	
	>100		23.3	17.2	
Hospital[a]	Yes	%	37.0	21.4	χ^2 (1, N = 55) = 1.6, *p*>.05
Hospital treat.	Medical	%	50	40	χ^2 (2, N = 15) = 0.9, *p*>.05
	Psych.		10	0	
	Both		40	60	
Suicide att.[b]	Yes	%	64.3	53.6	χ^2 (1, N = 56) = 0.7, *p*>.05
Type suic. att	Overdose	%	82.3	85.7	χ^2 (2, N = 31) = 1.9, *p*>.05
	Cutting		17.6	7.1	
	Hanging		0	7.1	
Help seek SI[c]	Yes	%	46.4	46.4	χ^2 (1, N = 56) = 0.0, *p*>.05
Help seek any[d]	Yes	%	60.7	66.7	χ^2 (1, N = 58) = 0.2, *p*>.05
How long help[e]	Years	<1	23.1	38.5	χ^2 (1, N = 26) = 0.7, *p*>.05
		>1	76.9	61.5	

Reason other help seek[f]	Axis I	%	71.4	100	χ^2 (1, N = 13) = 2.0, p>.05
	Axis II		28.6	0	
Current Ψ help?	Yes	%	46.7	33.3	χ^2 (1, N = 60) = 1.1, p>.05
Alc/drugs when NSSI[g]	Never/ rarely	%	55.6	65.5	χ^2 (2, N = 56) = 3.4, p>.05
	Sometimes		37.0	17.2	
	Always		7.4	17.2	

[a] Ever hospitalised for self-injury; [b] Ever attempted suicide; [c] Ever sought help for self-injury; [d] Ever sought help for any reason; [e] How long until sought help for NSSI; [f] Reasons for seeking help if not for NSSI; [g] When engaging in NSSI do you use alcohol or drugs at the time?

Suicidal intent

The mean ISS score for the BPD group was 6.2 (*SD* = 2.2), and for the NBPD group, the mean score was 4.9 (*SD* = 2.1), which are both in the lower end of the *medium* range for suicidal intent (Pierce, 1977). Unpaired t-tests indicated that the differences between the scores themselves were significant $t(58) = 2.2$, $p = .03$. However, there were no significant differences between the groups in terms of the category of suicidal intent (low, medium, high), $\chi^2(2, N = 60) = 3.3$, p>.05. For the category of low suicidal intent, 13.3% of individuals with BPD, and 30% of individuals without BPD fell into this category. For the medium category, 83.3 of individuals with BPD, and 70% of individuals without BPD had scores that fell within this range. Finally, there were 3.3% of individuals with BPD whose scores fell in the high range of suicidal intent, whereas none of the NBPD individuals' scores were classified as highly suicidal.

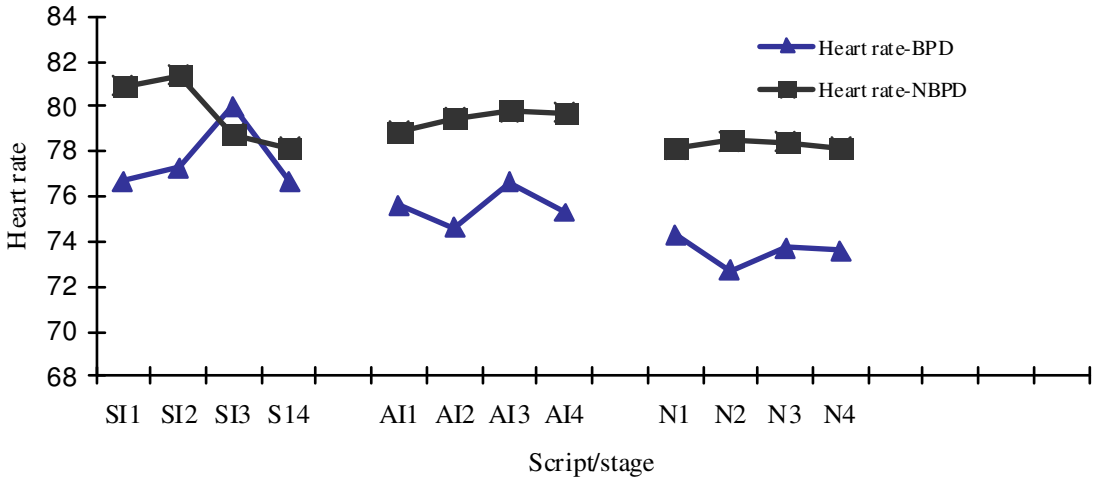
Responses to imagery

For the psychophysiological and subjective data, analyses of variance (ANOVAs) were conducted and Huynh Feldt corrections were applied. In addition, Fisher's Least Significant Difference (LSD) posthoc tests were used. This is a two-step testing procedure for pairwise comparisons of several treatment groups, and is known to preserve the type I error rate at the nominal level of significance. This correction has been applied in similar NSSI and BPD studies (e.g., Berlin, Rolls, & Iversen, 2005; Haines & Williams, 2003).

Psychophysiological data

The mean heart rate and psychological responses and standard deviations for each stage of each script for the BPD and NBPD groups are presented in Appendix D. In addition, there were items which assessed the clarity of script content (clear) and the accuracy of details in the script (close). Responses on both of these items were within the normal range. The results for these items are presented in Appendix D.

There was a significant script by stage by group interaction for heart rate, $F(6,348) = 2.9$, $MSE = 31.8$, $p = .009$. These results are presented in Figure 1.



Note: S = NSSI script, A = Accidental Injury script, N = Neutral script

Figure 1. Mean heart rate for each stage for each script for BPD and NBPD groups.

Post hoc results for script differences in heart rate at each stage are presented in Table 4. For the BPD group, there were no significant differences between scripts at the setting the scene stage. At the approach stage, the NSSI script elicited a higher heart rate than the neutral script. Then, at the incident stage, NSSI was associated with higher heart rate than the accidental injury and neutral scripts, and the accidental injury script was also associated with higher heart rate than the neutral script. There were no significant differences in heart rate at the consequence stage. In contrast, for the NBPD group, the NSSI script was associated with higher heart rate than the accidental injury and neutral script at the setting the scene stage. At the approach stage, NSSI was also associated with higher heart rate than the neutral script. There were no other significant differences at the incident or consequence stages.

Table 4

The post hoc analysis results for script differences at each stage for heart rate (BPM) for the BPD and NBPD groups.

Group	**Stage**	**df**	***F***	***MSE***	***p***	**Fisher's LSD**	**Differences**
BPD	Scene	2,58	1.0	41.7	ns		
	Approach	2,58	4.9	163.1	.02	3.0	SI>N
	Incident	2,58	11.0	299.1	.0001	2.7	SI>AI,N
							AI>N
	Consequence	2,58	2.9	90.0	ns		
NBPD	Scene	2,58	4.5	63.9	.02	1.9	SI>AI,N
	Approach	2,58	3.7	68.1	.03	2.2	SI>N
	Incident	2,58	1.0	17.0	ns		
	Consequence	2,58	1.4	22.0	ns		

Consideration then was given to post hoc results for the across stage changes for each script. These results are presented in Table 5. For the BPD group, heart rate at the scene and approach stages of the NSSI script were significantly lower than the incident stage, but the incident stage was associated with higher heart rate than the consequence stage. There were no other significant differences across stages of scripts for this group. In contrast, the NBPD group demonstrated higher heart rate in the scene and approach stages of the NSSI script than for the incident and consequence stages. There were no other significant differences across stages for the other scripts.

Table 5

The post hoc analysis results for across stage changes for each script for the BPD and NBPD groups for heart rate (BPM).

Group	Script	df	*F*	*MSE*	*p*	Fisher's LSD	Differences
BPD	NSSI	3,87	4.2	73.2	.008	2.1	1,2<3; 3>4
	AI	3,87	2.0	19.6	ns		
	N	3,87	1.5	14.1	ns		
NBPD	NSSI	3.87	8.3	73.3	.0001	1.5	1,2>3,4
	AI	3,87	0.3	4.7	ns		
	N	3,87	0.1	0.8	ns		

Psychological responses

The range of psychological responses to the imagery included anger, fear, unhappiness, anxiety, tension, control, risk to life, numbness (depersonalisation), unreality (derealisation), calm, relief, excitement and agitation. Group (BPD, NBPD) by script (NSSI, accidental injury, neutral), by stage (scene, approach, incident, consequence) ANOVAs were conducted for each of the VAS measures to determine if there were any between group differences in participants' subjective responses to the imagery. It should be noted that not all 60 participants provided data for the items calm, relief, excitement and agitation (BPD, n = 16; NBPD, n = 19). These four items were only added after initial results from pilot testing (Haines & Bowe, 2008), indicated the need for a broader range of emotions to be included in order to complement psychophysiological results.

Firstly, script by stage by group analyses were performed, and there were no significant differences between the BPD and NBPD groups in terms of psychological

responses to the imagery. Next, consideration was given to script by stage interactions. Means and standard deviations for each stage of each script are presented in Appendix D. There were significant script by stage interactions for the psychological items of tension, $F(6, 348) = 35.3$, $MSE = 15413.3$, $p = .0001$, anxiety, $F(6, 348) = 37.5$, $MSE = 15217.6$, $p = .0001$, anger, $F(6,348) = 19.3$, $MSE = 9099.8$, $p = .0001$, fear, $F(6,348) = 13.2$, $MSE = 6241.0$, $p = .0001$, and unhappiness, $F(6,348) = 25.0$, $MSE = 12013.0$, $p = .0001$. These results are presented in Figure 2.

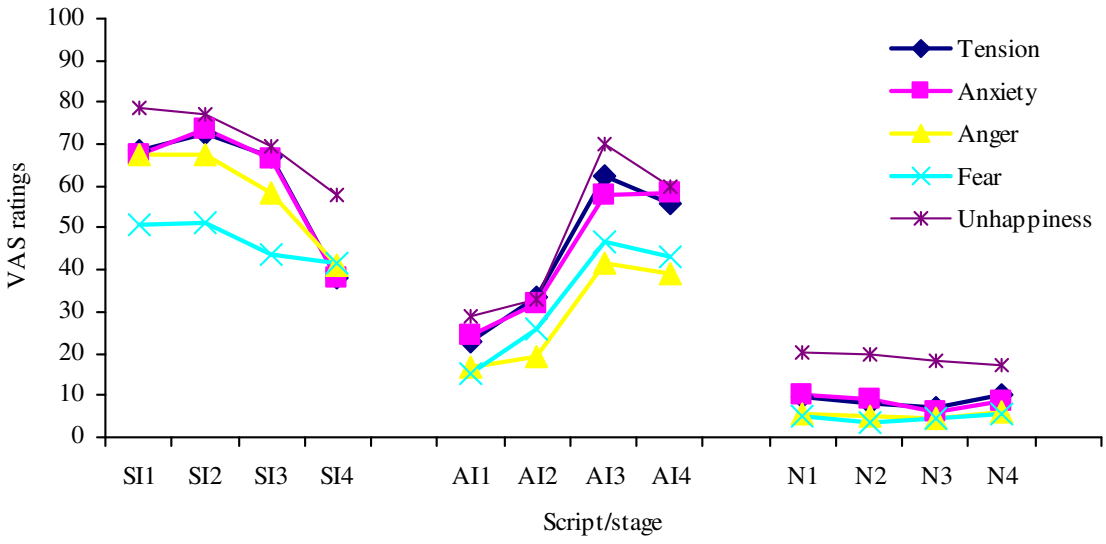


Figure 2. The mean ratings for tension, anxiety, anger, fear and unhappiness for each stage of each script.

There were also significant script by stage interactions for calm, $F(6,198) = 13.9$, $MSE = 7700.1$, $p = .0001$, relief, $F(6,198) = 17.3$, $MSE = 9236.4$, $p = .0001$, excitement, $F(6,198) = 6.6$, $MSE = 2674.2$, $p = .0001$, and agitation, $F(6,198) =$

16.9, *MSE* = 908.9, *p* = .0001. These results are presented in Figure 3.

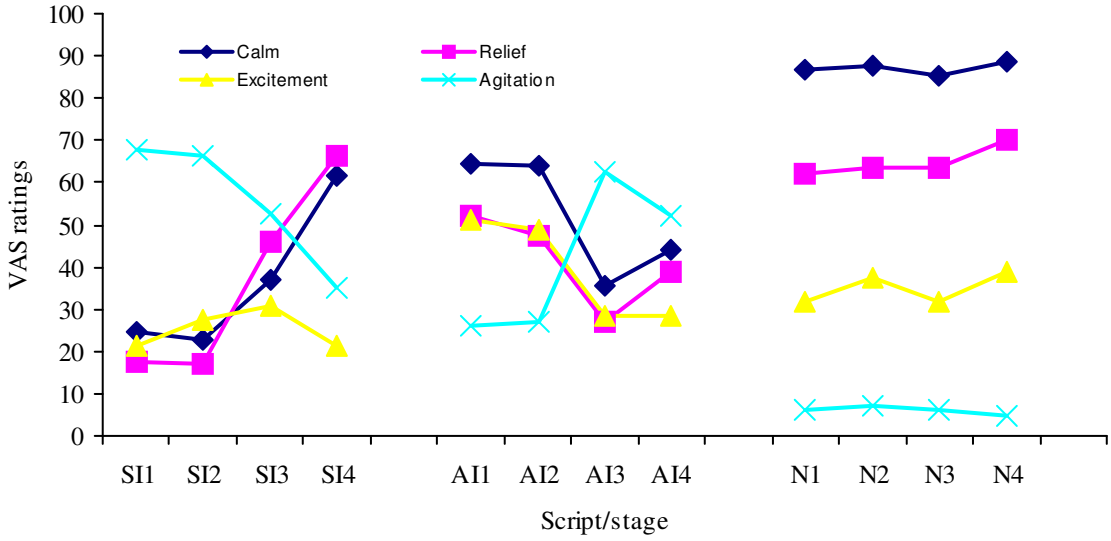


Figure 3. The mean ratings for calm, relief, excitement and agitation for each stage of each script.

In addition, there were also significant script by stage interactions for the VAS ratings of unreality (derealisation), $F(6,348) = 3.0,1135.0$, $p = .007$, numbness (depersonalisation), $F(6,348) = 5.0$, $MSE = 1505.5$, $p = .0001$, risk to life, $F(6,348) = 5.5$, $MSE = 1568.4$, $p = .0001$, and control, $F(6,348) = 10.4$, $MSE = 5849.3$, $p = .0001$. These results are presented in Figure 4.

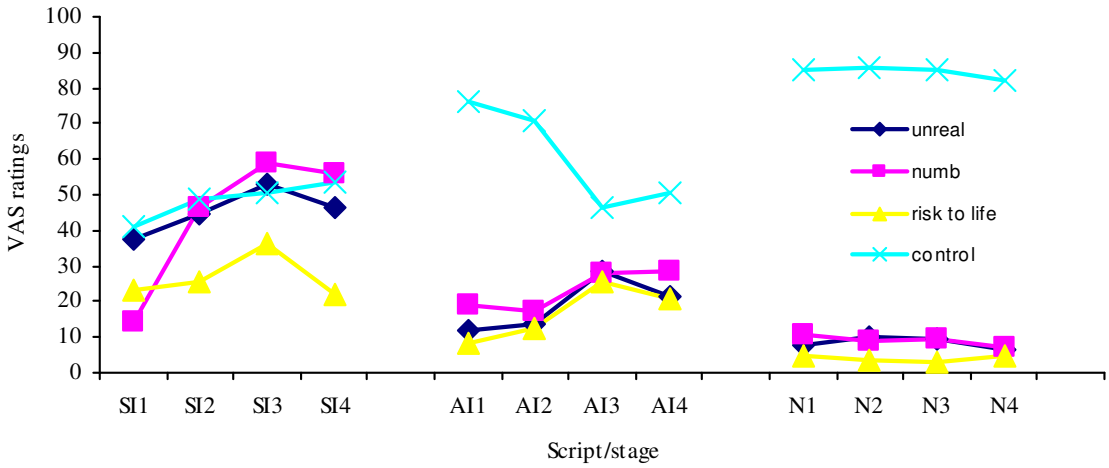


Figure 4. The mean ratings for unreal, numb, risk to life and control, for each stage of each script..

Consideration was given to the script differences at each stage. The means and standard deviations are presented in Appendix D. Post hoc analysis results are presented in Table 6.

Table 6

The post hoc analysis results for script differences at each stage for VAS items for BPD and NBPD groups.

VAS Item	**Stage**	**df**	***F***	***MSE***	***p***	**Fisher's LSD**	**Differences**
Tense	Scene	2, 118	86.6	57214.8	.0001	9.3	SI> AI, N AI>N
	Approach	2, 118	97.3	63558.8	.0001	9.2	SI> AI, N AI>N
	Incident	2, 118	96.9	66953.2	.0001	9.5	SI,AI>N
	Consequence	2, 118	39.3	31686.1	.0001	10.3	AI>SI,N SI>N
Anxious	Scene	2,118	77.9	52851.0	.0001	9.4	SI>AI,N AI>N
	Approach	2,118	88.9	63552.6	.0001	9.7	SI>AI,N AI>N
	Incident	2,118	87.9	64131.7	.0001	9.8	SI,AI>N
	Consequence	2,118	47.2	37201.8	.0001	10.1	AI>SI,N SI>N
Anger	Scene	2,118	118.1	65172.8	.0001	8.5	SI>AI,N AI>N
	Approach	2,118	117.8	64123.6	.0001	8.4	SI>AI,N AI>N
	Incident	2,118	58.0	46142.0	.0001	10.2	SI>AI,N AI>N
	Consequence	2,118	26.3	23198.7	.0001	10.8	SI,AI>N
Fear	Scene	2,118	65.9	35250.9	.0001	8.4	SI>AI,N AI>N
	Approach	2,118	45.6	34503.3	.0001	9.9	SI>AI,N AI>N
	Incident	2,118	41.2	32883.5	.0001	10.2	SI,AI>N
	Consequence	2,118	31.5	27321.4	.0001	10.6	SI,AI>N

Unhappy	Scene	2,118	92.2	5979.8	.0001	9.2	SI>AI,N
	Approach		76.8	54272.9	.0001	9.6	SI>AI,N AI>N
	Incident	2,118	65.4	48962.4	.0001	9.9	SI,AI>N
	Consequence	2,118	35.3	34541.6	.0001	11.3	SI,AI>N
Calm	Scene	2,68	52.1	34673.2	.0001	12.3	SI<AI,N AI<N
	Approach	2,68	75.3	37468.5	.0001	10.6	SI<AI,N AI<N
	Incident	2,68	39.0	27967.2	.0001	12.8	SI,AI<N
	Consequence	2,68	21.0	17607.1	.0001	13.8	SI,N>AI SI<N
Relief	Scene	2,68	29.5	18776.3	.0001	12.0	SI<AI,N
	Approach	2,68	36.1	19421.8	.0001	11.1	SI<AI,N AI<N
	Incident	2,68	10.8	11023.3	.0001	15.3	SI,AI<N SI>AI
	Consequence	2,68	8.6	10213.6	.0005	16.4	SI,N>AI
Excite	Scene	2,68	10.0	7952.2	.0002	13.5	AI>SI,N
	Approach	2,68	5.2	3937.2	.009	13.2	SI<AI
	Incident	2,68	0.1	012.6	ns		
	Consequence	2,68	4.4	2799.6	.02	12.1	SI<N
Agitation	Scene	2,68	63.0	34431.5	.0001	11.1	SI,AI>N SI>AI
	Approach	2,68	47.5	32029.8	.0001	12.4	SI,AI>N SI>AI
	Incident	2,68	39.1	31504.7	.0001	13.5	SI,AI>N
	Consequence	2,68	26.1	19989.3	.0001	13.2	AI>SI,N SI>N
Unreality	Scene	2,118	27.7	153781.7	.0001	8.5	SI>AI,N
	Approach	2,118	31.2	21654.7	.0001	9.5	SI>AI,N
	Incident	2,118	40.4	28992.7	.0001	9.7	SI,AI>N SI>AI

	Consequence	2,118	36.6	24607.1	.0001	9.4	SI,AI>N SI>AI
Numb	Scene	2,118	23.2	16265.9	.0001	9.6	SI>AI,N
	Approach	2,118	27.9	22669.6	.0001	10.3	SI>AI,N
	Incident	2,118	49.1	36975.2	.0001	9.9	SI>AI,N AI>N
	Consequence	2, 118	54.2	35360.9	.0001	9.2	SI>AI,N AI>N
Risk to life	Scene	2,118	16.2	5853.9	.0001	6.9	SI>AI,N
	Approach	2,118	17.5	7390.6	.0001	7.4	SI>AI,N AI>N
	Incident	2,118	26.4	17123.7	.0001	9.2	SI>AI,N AI>N
	Consequence	2,118	8.6	5637.8	.0003	9.2	SI,AI>N
Control	Scene	2,118	47.4	32955.6	.0001	9.5	SI<AI,N AI<N
	Approach	2,118	28.3	20277.7	.0001	9.7	SI<AI,N AI<N
	Incident	2,118	30.0	26902.1	.0001	10.8	SI,AI<N
	Consequence	2,118	18.8	18459.1	.0001	11.3	SI,AI<N

For the ratings of psychological response to imagery, the NSSI script elicited stronger ratings of tension than did the accidental injury and neutral scripts at the scene, approach and incident stages, although the accidental injury script elicited more tension than the NSSI at the consequence stage. The accidental injury script elicited greater tension than the neutral script at each stage of each script. Similarly, the NSSI script elicited greater anxiety than the accidental injury and neutral scripts at the scene, approach and incident stages, but the accidental injury script produced more anxiety than NSSI or neutral scripts at the consequence stage. The accidental injury script elicited more anxiety than the neutral script at all stages of each script.

In addition, the NSSI script elicited greater anger than the accidental injury or neutral scripts at all stages. The accidental injury script also elicited greater anger than the neutral script at all stages.

For the VAS ratings of fear, the NSSI script elicited greater levels of fear than the accidental injury and neutrals scripts, at all stages. Fear was also higher for each stage in the accidental injury script than it was in the neutral script. Finally, the NSSI script elicited greater unhappiness than the accidental injury or neutral scripts at each stage. The accidental injury script also elicited greater unhappiness than the neutral script at the approach stage.

For the ratings of calm, the NSSI script elicited lower ratings of calm than the accidental injury and neutral scripts at scene, approach and incident stages. At the consequence stage, NSSI elicited greater ratings of calm than the accidental injury script, but ratings of calm were greater for the neutral script than NSSI. Accidental injury elicited lower levels of calm than the neutral script at scene, approach and incident stages.

In terms of the ratings for relief, the NSSI script elicited lower levels of relief than the accidental injury and neutral scripts at the scene, approach and incident stages. The NSSI elicited greater relief in the consequence stage than accidental injury script. The neutral script elicited greater relief than NSSI and accidental injury scripts at all stages, except for the consequence stage where NSSI and neutral scripts were equally higher in ratings of relief than the accidental injury script. The accidental injury script elicited higher ratings of excitement than the NSSI and neutral scripts at the scene stage. NSSI elicited less excitement than the accidental injury script at the approach stage, and NSSI was less exciting than the neutral script

at the consequence stage. The NSSI script elicited more agitation than the neutral and accidental injury scripts at scene, approach and incident stages of the scripts. The accidental injury script elicited more agitation than NSSI and neutral scripts at the consequence stage, and the accidental injury script elicited great agitation than the neutral script at all stages.

For the ratings of unreality, the NSSI script elicited higher ratings of de-realisation than the accidental injury script and the neutral script at all stages. The accidental injury script was also associated with higher ratings of unreality than the neutral script at the incident and consequences stages of the script. For the VAS ratings of numbness, NSSI elicited higher ratings of depersonalisation than the accidental injury and neutral scripts at all stages. The accidental injury script also elicited more depersonalisation than the neutral script at the incident and consequence stages of the script. For risk to life, the NSSI script was associated with higher levels of risk than the accidental injury and neutral script at all stages. The accidental injury script was associated with higher risk to life than the neutral script at the incident and consequence stages of the script. Finally, for control, the NSSI was associated with lower levels of perceived control than the accidental injury script and the neutral script at all stages. The accidental injury script was associated with less control than the neutral script at the scene and approach stages.

Across stage changes were then considered. Means and standard deviations are presented in Appendix D. The post hoc analyses are presented in Table 7.

Table 7

The post hoc analysis results for across stage changes for each script for the BPD and NBPD groups for VAS items

VAS Item	**Script**	**df**	***F***	***MSE***	***p***	**Fisher's LSD**	**Differences**
Tense	NSSI	3,177	20.5	148997	.0001	9.7	1,2,3>4
	AI	3,177	43.0	20816.7	.0001	7.9	1,2<3,4
	N	3,177	1.2	1339.2	ns		
Anxious	NSSI	3,177	21.9	15048.0	.0001	9.4	1,2,3>4
	AI	3,177	38.4	18391.8	.0001	7.9	1,2>3,4
	N	3,117	1.9	227.1	ns		
Anger	NSSI	3,117	12.8	9316.5	.0001	9.7	1,2,3>4
	AI	3,177	14.6	10109.4	.0001	9.5	1,2<3,4
	N	3,177	0.6	37.7	ns		
Fear	NSSI	3,177	2.0	1480.3	ns		
	AI	3,177	20.8	13238.0	.0001	9.1	1<2,3,4 2<3,4
	N	3,117	0.8	51.6	ns		
Unhappy	NSSI	3,177	9.6	5396.6	.0001	8.6	1>3,4 2,3>4
	AI	3,177	31.8	21255.3	.0001	9.3	1,2>3,4
	N	3,177	1.1	115.3	ns		

Calm	NSSI	3,102	17.6	11105.1	.0001	11.9	1,2,3<4 1,2<3
	AI	3,102	9.1	7346.9	.0001	13.5	1,2>3,4
	N	3,102	0.8	67.4	ns		
Relief	NSSI	3,102	29.3	20135.4	.0001	12.4	1,2<3,4 3<4
	AI	3,102	5.7	3929.6	.001	12.5	1,2>3 1>4
	N	3,102	1.7	467.4	ns		
Excitement	NSSI	3,102	1.7	783.4	ns		
	AI	3,102	8.7	5394.1	.0001	11.8	1,2>3,4
	N	3,102	2.7	522.1	ns		
Agitation	NSSI	3,102	10.6	8089.3	.0001	13.1	1,2>3,4 3>4
	AI	3,102	14.11	11618.0	.0001	13.6	1,2<3,4
	N	3,102	1.2	28.8	ns		
Unreality	NSSI	3,177	4.2	2527.3	.007	8.8	1<3,4
	AI	3,177	8.6	3537.7	.0001	7.3	1,2<3,4
	N	3,177	2.0	173.2	ns		
Numb	NSSI	3,177	7.1	4122.4	.0001	8.7	1,2<3,4
	AI	3,177	8.8	2919.4	.0001	6.6	1,2<3,4
	N	3,177	3.4	123.3	.02	2.2	1,3>4
Risk to life	NSSI	3,177	5.5	2498.3	.002	7.7	1,2<3 3>4
	AI	3,177	9.1	363.2	.0001	7.2	1,2<3,4
	N		0.5	37.6	ns		

Control	NSSI	3,177	2.3	1640.9	ns		
	AI		16.3	12659.0	.0001	10.0	1,2>3,4
	N		0.7	153.4	ns		

When psychological reactions to NSSI were considered, tension at the scene, approach and incident stages was rated as significantly higher than at the consequence stage. For the accidental injury script, tension was rated lower at the scene and approach stages than it was at the consequence stage. Anxiety was rated higher in the scene, approach and incident stages if the NSSI script than it was in the consequence stage. Anxiety was also rated higher in the scene and approach stages of the accidental injury script than it was in the incident and consequence stages. For anger, the scene, approach and incident stages of the NSSI script elicited higher levels of anger than the consequence stage. Anger levels were also higher in the scene and approach stages of the accidental injury script than they were in the incident and consequence stages.

There were no significant effects for fear in the NSSI script, but for the accidental injury script, fear was significantly lower in the scene stage than it was in subsequent stages of the script. For unhappiness, the scene stage of the NSSI was rated with significantly higher levels of unhappiness than at the incident and consequence stages. Ratings of unhappiness in the approach and incident stages were also significantly higher than ratings of unhappiness in the consequence stage of this script. For the accidental injury script, the scene and approach stages were rated as significantly more unhappy than the incident and consequence stages.

For ratings of calm, the consequence stage of the NSSI script elicited

significantly higher ratings of calm than the preceding stages. The scene and approach stages were rated as significantly less calm than the incident stage. For the accidental injury script, the scene and approach stages were significantly calmer than the incident and consequence stages. Ratings of relief were greater in the incident and consequence stages of the NSSI script than the scene and approach stages. The incident stage was also associated with significantly greater feelings of relief than the scene and approach stages. For the accidental injury script, the scene and approach stages were associated with significantly greater feelings of relief than incident and consequence stages of this script.

There were no significant effects for feelings of excitement in the NSSI script. For the accidental injury script, the scene and approach stages were associated with significantly higher levels of excitement than the incident and consequence stages. For agitation, the scene and approach stages of the NSSI script were associated with higher levels of agitation than the incident and consequence stages. The incident stage of this script was associated with significantly higher levels of agitation than the consequence stage. For the accidental injury script, the incident and consequence stages were associated with higher levels of agitation than the scene and approach stages.

For unreality, the NSSI script was associated with less derealisation in the scene stage, in comparison to the incident and approach stages. For the accidental injury script, derealisation was lower in the scene and approach stages than it was in the incident and consequence stages.

For numbness, feelings of depersonalisation were lower in the scene and

approach stages than they were in the incident and consequence stages. In the accidental injury script, the scene and approach stages were associated with lower levels of depersonalisation than the incident and consequence stages. For the neutral script, the scene and incident stages were associated with higher levels of depersonalisation than they consequence stage although the overall levels were low.

For perceived risk to life, the NSSI script was associated with lower risk at the scene and approach stages than it was for the incident stages, and the incident stage was associated with greater risk to life than the consequence stage. For the accidental injury script, risk to life was perceived as lower during the scene and approach stages than it was at the incident and consequence stages.

Finally, for perceived levels of control, only the accidental injury script elicited a significant difference. The scene and approach stages were associated with higher levels of perceived control than the incident and consequence stages.

In summary, there were significant differences between BPD and NBPD groups for the psychophysiological ratings of heart rate only. On all other variables, the two groups were similar. In terms of overall group responses, the NSSI script was generally associated with negative emotions such as anxiety, tension and unhappiness rather than positive emotions such as excitement. These negative emotions were also rated higher in the NSSI script than in the accidental injury and neutral scripts. Similarly, the NSSI script was more likely to be associated with lower levels of perceived control and higher levels of perceived risk to life than the accidental injury or neutral scripts. It was noted that negative emotions were present in the build-up to engaging in NSSI, which was then replaced with feelings of relaxation and calm

during the incident and consequence stages.

DISCUSSION

Psychophysiological responses

It was the aim of this study to examine whether the processes associated with NSSI were the same for both those with and without a diagnosis of BPD. It was hypothesised that the BPD group would demonstrate an arousal increase during the incident stage of the NSSI script, whereas the NBPD group would demonstrate a decrease in arousal. Examining the psychophysiological responses to NSSI in each group, it was clear that there was support for this hypothesis, as there was a fundamental difference in psychophysiological responding between the BPD and NBPD group.

The tension reduction model of NSSI previously has been supported in populations without BPD (Brain et al., 1998a, 1988b, 2002; Haines, Williams, & Brain, 1995). This model proposes that the experience of negative emotions (e.g., anxiety) combined with a high level of arousal (increased heart rate) motivates the individual to engage in NSSI. When the act of NSSI commences (i.e., the individual cuts into his/her skin), the body produces increased levels of endogenous opiates such as β-endorphins and enkephalins, which results in low arousal and subjective feelings of relief (Brain et al., 1998a, 1988b, 2002; Haines, Williams, & Brain, 1995). In the current study, the NBPD group demonstrated a psychophysiological pattern of responding that was consistent with the tension reduction response observed in previous research.

In contrast, the psychophysiological responses in the BPD group were inconsistent with the previously established tension reduction model. Before engaging in NSSI this group reported subjective feelings of negative emotions but they demonstrated low levels of psychophysiological arousal. During the act of engaging in NSSI they demonstrated high levels of psychophysiological arousal, but reported subjective feelings of negative emotions. Immediately after engaging in NSSI they demonstrated low psychophysiological arousal and reported feeling positive emotions. In order to explain these differences in patterns of responding, Figure 5 outlines a model of three proposed pathways to engaging in NSSI. It demonstrates (1) a pattern of tension reduction which has previously been demonstrated in individuals without BPD, (2) a proposed pattern of responding which may be unique to individuals with BPD, and finally, (3) a proposed pattern of responding demonstrated for those individuals who have engaged in NSSI once or twice, but have not repeated the behaviour. Potentially, this may explain the affect regulation process for individuals who try self-injury (e.g., through modelling of the behaviour believing it to be a helpful strategy), but find that it does not work for them.

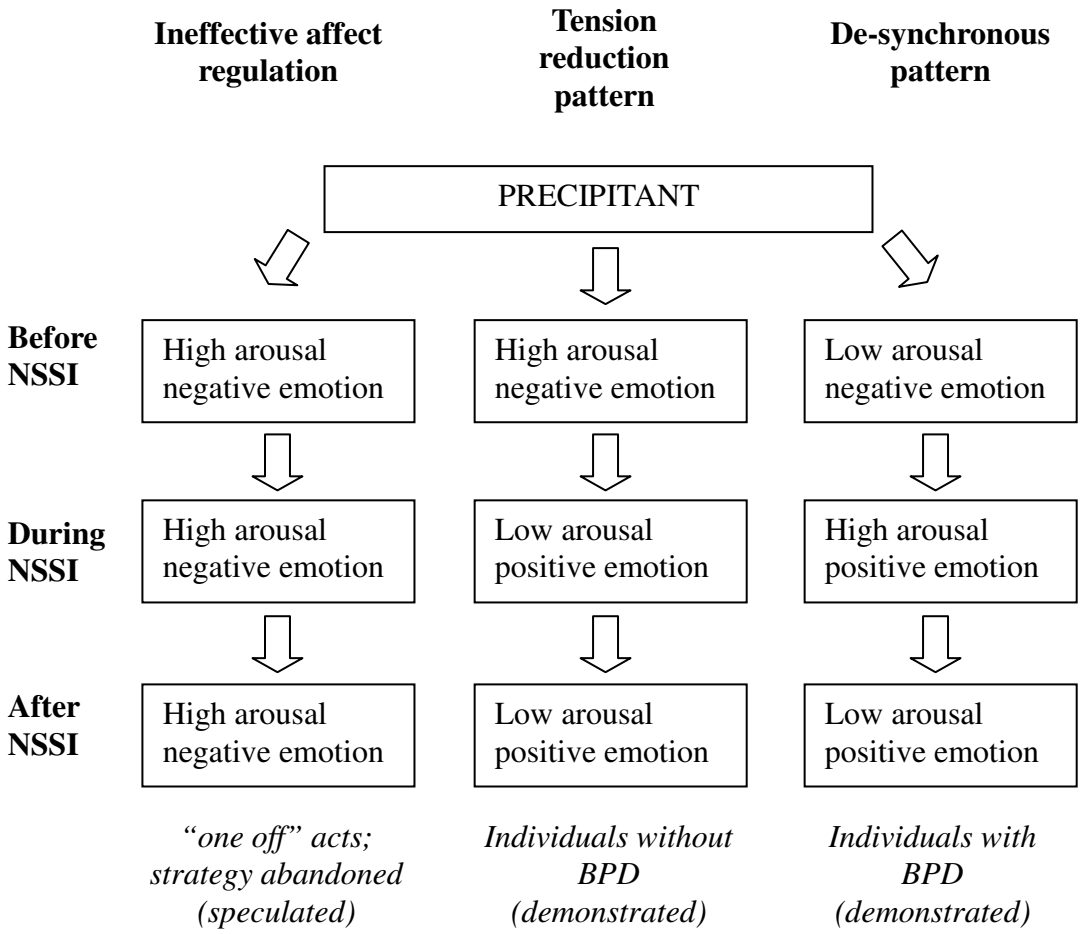


Figure 5. A model of the affect regulation process associated with NSSI in individuals with and without BPD.

It can be argued that for both individuals with and without BPD, the act of NSSI provides an affect regulatory function, however, the pattern of affect regulation associated with NSSI is clearly different for each group. For the NBPD group, the pattern of low arousal during the act of NSSI is consistent with previous research (Brain et al., 1998a, 1998b, 2002; Haines, Williams, & Brain, 1995). However, the seemingly inconsistent pattern of response demonstrated by the BPD group in the

current study requires further explanation.

It appears that individuals with BPD demonstrate a low level of arousal before and after engaging in the NSSI, which implies low distress. Of course, some negative emotional states are related to low arousal. For example, individuals who experience symptoms of hyersomnia, psychomotor retardation and lethargy as part of a Major Depressive Episode (APA, 2000) may experience low arousal and negative mood. However, it seems unlikely that this was the case for participants in the current study as they still reported emotional states (e.g., tension, anger and anxiety), that were not consistent with a low level of arousal. It perhaps seems more likely that if the participants were experiencing depressive symptoms, then these were more consistent with an agitated form of symptoms (e.g., psychomotor agitation, APA, 2000).

It is difficult to understand why individuals would only feel high levels of arousal during the actual cutting incident, and would not have a build up of tension similar to the NBPD group. To accept that such a response could occur, it also would have to be accepted that the self-injurious behaviour was entirely unanticipated cognitively, and that self-injurious behaviour was entirely externally driven. However, it has not been suggested that all acts of self-injurious behaviour are precipitated by unanticipated external events only.

It perhaps could be the case that BPD individuals demonstrate a lag effect in their responses and that they take longer to react to the imagery than the NBPD group. Certainly, the psychological ratings (which will be discussed in detail later) indicated that there were increases in anxiety and tension from the scene stage and peaking at the incident stage with a subsequent decline thereafter. In this way, the

tension reduction did not occur until the consequence stage when the immediate aftermath of the act was experienced. It has been noted elsewhere that there can be a lag between the psychophysiological reduction in arousal and a report of the end of negative psychological states (Haines, Williams, & Brain, 1995) that may be influenced by the length of time since the last self-injurious episode (Brain et al., 1998a, 1998b). However, the current results did not appear to reflect this lag. Indeed, the increase in arousal at the time of cutting was stage-specific and was related to the act of cutting.

Even if it is the case that when individuals with BPD are distressed it takes longer for them to return to baseline, as has been suggested as part of the biosocial model of BPD (Crowell et al., 2009; Linehan, 1993), then this explanation does not account for the pre-cutting, or indeed the post-cutting state demonstrated in the current findings.

When the psychophysiological results are considered separately from the psychological results, a more fitting explanation may be that, for individuals with BPD, NSSI serves a self-stimulatory purpose. In this way, it is proposed that low arousal may act as a precipitant to NSSI for individuals with BPD. As previously stated, Herpertz and colleagues (1999) have suggested that individuals with BPD experience autonomic underarousal, and that this interferes with their ability to cope with their emotions and their environment, because this underarousal state is uncomfortable for them. Similarly, recent research also has indicated that individuals with BPD experience opioid deficiencies, and that these deficiencies can be controlled by the rewarding experiences of engaging in self-cutting (e.g., New & Stanley, 2010; Prossin, Love, Koeppe, Zubieta, & Silk, 2010; Stanley et al., 2010).

This provides further evidence that individuals with BPD may have a strong biologically-based need for sensation seeking as a motivation for NSSI.

The DSM-IV-TR (APA, 2000) also states that chronic feelings of emptiness are a fundamental component of BPD psychopathology, and previously the DSM-III-R (APA, 1987) referred more specifically to chronic feelings of boredom. In the current study it could be suggested that boredom (a negative emotion accompanied with low arousal) could act as a precipitant to engaging in NSSI. One previous study reported that boredom was a precipitant to NSSI in a sample of female inmates (Chapman & Dixon-Gordon, 2007), and another stated that males were more likely than females to report boredom prior to engaging in NSSI (Laye-Gindhu et al., 2005). It has been stated elsewhere that individuals with BPD have a low tolerance for boredom (e.g., Gunderson & Links, 2008), and it has also been stated that NSSI may be viewed by some as a behaviour which is exciting and rewarding (e.g., (Favazza, 2011; Kemperman et al., 1997; Kleindienst et al., 2008; Kreisman & Straus, 2004; Osuch et al.,1999; Selekman, 2009). Perhaps then, for some individuals with BPD, autonomic under arousal and the tendency to feel emptiness or 'nothing', increases the likelihood that they will engage in sensation seeking experiences (e.g., Herpertz et al., 1999). This de-synchronous pattern of responding to NSSI for the BPD group is depicted in Figure 6.

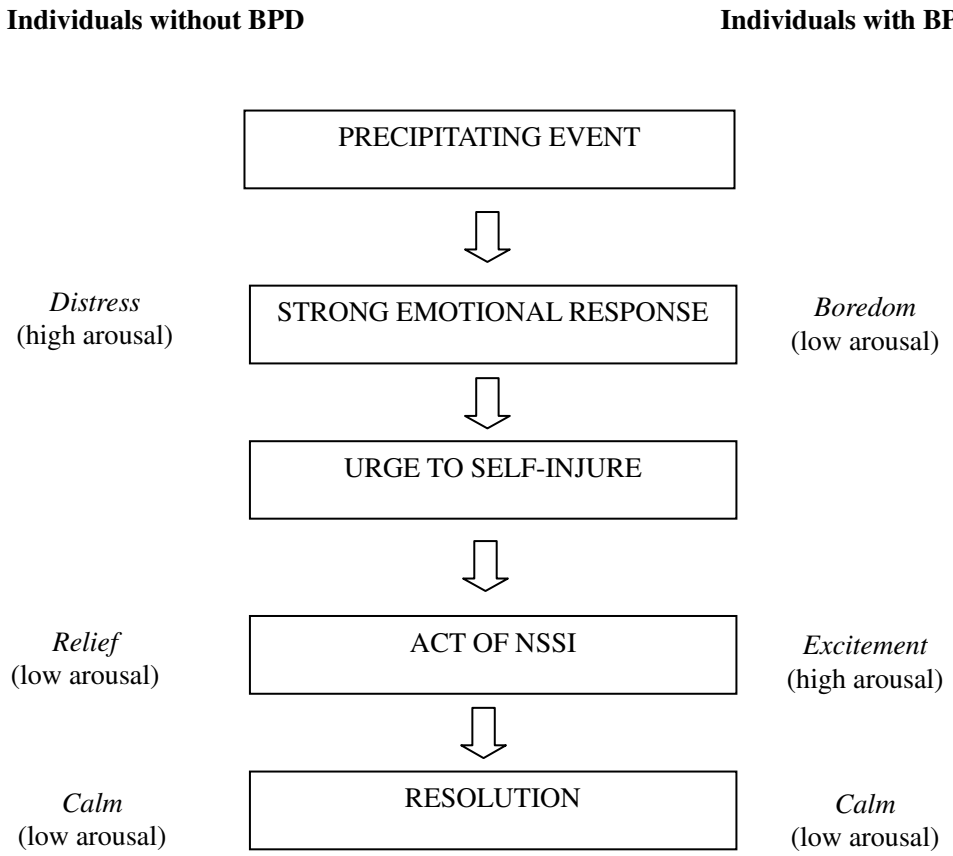


Figure 6. Explanation for seemingly inconsistent pattern of response to NSSI in BPD.

In terms of psychophysiological responses to the control scripts, it was hypothesised that the NSSI script would be associated with higher levels of psychophysiological arousal than the accidental injury and neutral scripts, and that this would be the same for both groups. The results indicated that, generally speaking, this hypothesis was supported. For the accidental injury script, it was anticipated that this would be associated with a higher level of arousal than the neutral script for both groups, due to the details regarding injury. There were no

significant differences between the accidental injury and neutral scripts for the NBPD group. Previous research has demonstrated that despite deliberately engaging in self-cutting, individuals who engage in NSSI still respond appropriately to imagery of accidental injury (e.g., Brain et al., 1998a, 1998b; Haines, Williams, & Brain, 1995). That is, they do not experience tension reduction in response to these types of injuries.

Of course, the fact that accidental injury imagery was not experienced with a strong increase in psychophysiological arousal needs to be considered. An explanation as to why participants in the current study did not demonstrate significantly higher levels of arousal in response to the accidental injury script may be that they had habituated to the experience of injury and pain over time. Approximately 44% of the NBPD group had engaged in NSSI for five years of more, with a further 31% having deliberately cut themselves on approximately 100 or more occasions. This may have contributed to the fact that these individuals were not particularly distressed when recalling their accidental injuries. Additionally, it may have been the case that participants reacted more strongly to NSSI than accidental injury due to the strong emotional precipitants associated with NSSI. It may be the case that accidental injury was not as strongly associated with these emotional components, even if the injury itself was unwelcomed. However, it is also worth considering the variability of the accidental injuries (e.g., accidents associated with sport, and food preparation), and that the bodily damage inflicted by the majority of the participants' injuries was relatively minor.

For the BPD group there was a significant difference in arousal between the accidental injury script and neutral script during the incident stage with the

accidental injury script eliciting the stronger response. The same was not as strongly evident for the NBPD group. This may be a reflection of the dramatic and novelty-seeking aspects of the BPD presentation. Similarly to the NSSI script, it does not appear that individuals remained aroused after this point, and there was no particular evidence that they were slow to return to baseline.

It also was hypothesised that there would be no particular increase or decrease in arousal for either group throughout the neutral script. This was true for the NBPD group, however the BPD group demonstrated a slight arousal decrease in the approach stage of the neutral script, and then an increase in arousal throughout the remainder of the script. It is not clear why this occurred. The approach stage of the neutral script was typically associated with preparing necessary items for making a cup of coffee (e.g., collecting cup, getting sugar out of the cupboard). Again, this may demonstrate further evidence that individuals with BPD 'over-react' to emotionally neutral stimuli as part of a fundamental difficulty with affect regulation (e.g., Herpertz et al., 1997). However, it was apparent that the overall level of arousal for the neutral script was quite low, so it could be argued that these sight variations in responding across the scripts may not have been particularly meaningful, and may simply be an artefact.

In an attempt to understand why individuals with BPD may demonstrate this pattern of psychophysiological arousal in response to NSSI, it may be important to consider the function of other self-destructive behaviours in which individuals with BPD engage. For example, it is diagnostically relevant that people with BPD engage in a range of impulsive and high risk behaviours (APA, 2000). In general, these types of behaviours are considered to have an affect regulating function (Williams,

2006). For example, reckless sexual behaviour is generally considered to be consistent with novelty seeking (Gil, 2005) and to be a high risk and impulsive but pleasurable experience (Teese & Bradley, 2008). In addition, shoplifting has been reported to have an arousal management function in that engaging in the behaviour tends to be associated with sensation seeking and excitement (Gudjonsson, 1987). Although the behaviours of NSSI, risky sex and shoplifting are diverse, they are all associated by their shared links with impulsivity and riskiness. For people with BPD, they share other specific similarities in that they may all operate as a self-stimulating mechanism. This will be considered in more detail in subsequent chapters.

Psychological responses

It would be expected that the experience of a heightened state of psychophysiological arousal would be consistent with an individual's self-reported experiences of a high level of emotion, be it negative, or positive in direction. For example, it would be expected that an individual who demonstrates increased heart rate may report feeling negative emotions such as anxiety or anger, or positive emotions such as excitement. Feelings of unhappiness, tension, anxiety, and low levels of perceived control have all been reported to be experienced by people who self-injure (Klonsky, 2007; McAuliffe, Arensman, Keeley, Corcoran, & Fitzgerald, 2007).

For the NBPD group in the current study it was hypothesised that the act of NSSI would provide relief from these negative emotions, and that they would report positive emotions consistent with a low arousal state during the act of NSSI. Results

indicated that the NBPD group's subjective responses to the imagery supported this notion. There was an escalation of negative emotions prior to engaging in NSSI in the first two stages of the imagery script. As participants' heart rates increased during the setting the scene and approach stages, their subjective ratings of anger, anxiety, and tension also increased. During the incident stage of NSSI, when cutting occurred, participants reported that they felt calm and relaxed, which is consistent with low arousal. In this way, there was synchrony between the psychophysiological and psychological responses to NSSI.

However, the hypothesis that the BPD group would report a high, positive affective state consistent with their psychophysiological response (e.g., excitement) was not supported. The BPD group's subjective ratings to the imagery of NSSI were de-synchronous with their pattern of psychophysiological responding. Instead of reporting excitement as a corresponding emotion to their arousal increase during NSSI, participants instead reported a positive but low arousal emotional state (e.g., relief) in a similar fashion to the NBPD group. A heightened state of psychophysiological arousal simply cannot be consistent with an individual feeling calm and relieved, although the combination of relief and excitement may produce high arousal states.

The conundrum of why this arousal increase is not reflected in the groups' subjective ratings must then be addressed. Firstly, it seems important to re-state the finding that when subjective psychological responses to imagery were considered, there were no significant differences between the BPD and NBPD group. In a similar fashion to the NBPD group, the individuals with BPD reported escalating feelings of tension, anger and anxiety that were reportedly resolved with the act of NSSI. If

interpretation was offered of these subjective psychological ratings in isolation, then the responses of the two groups to NSSI would appear to be virtually indistinguishable.

It is possible that this de-synchronous pattern of responding in the BPD group can be explained by taking into account some of the research literature in the broader context of psychopathology in BPD. For example, it is of interest that the research literature has indicated a specific relationship between BPD and alexithymia (e.g., Taylor et al., 1997; Webb & McMurran, 2008; Zlotnick et al, 1996). Research consistently has demonstrated that individuals with BPD have fundamental difficulties in identifying, labelling, understanding and communicating emotions. It also suggests that individuals with BPD struggle to differentiate between similar emotions and somatic sensations, which impairs their ability to then regulate their emotions (Guttman & LaPorte, 2002; Webb & McMurran, 2008; Williams, 2006). For example, anger and anxiety result in similar psychophysiological sensations, and often are treated using the same principles and techniques (e.g., Barlow, 2002). For individuals with BPD, it may be the case that they can identify the direction of their emotional experience as either positive or negative, but that they struggle to differentiate between similar arousal states (e.g., excited versus anxious). This may also relate to DSM-IV-TR (APA, 2000) criterion 2 (instability in relationships), in explaining why individuals with BPD have such difficulties with interpersonal relationships. For example, anxiety about being abandoned by a significant other may actually be experienced by the BPD individual as anger rather than anxiety (APA, 2000), because these are similar arousal states. When the individual with BPD then communicates this anger, this may create conflict and confusion for the other

person who is struggling to understand why the individual with BPD is so angry.

It has been recognised that other groups of individuals with personality-based pathology (chiefly, psychopathy), have difficulties with alexithymia and associated difficulties with empathy (e.g., Haviland, Sonne, & Kowert, 2004; Kirsch & Becker, 2007; Pham, Ducros, & Luminet, 2010). There has been some research attention given to BPD features in the context of psychopathy, which some authors have argued can be used to differentiate between *primary* and *secondary* psychopathy. In brief, primary psychopathy is thought to be associated with cold, callous behaviour, narcissism and positive affect in relation to impulsive violence. Secondary psychopathy, on the other hand, shares overlapping features with BPD in that these individuals have difficulty with affect regulation, are dramatic, and their motivation for engaging in impulsive aggression tends to relate to negative affect and interpersonal difficulties (e.g., Blackburn, 1998; Blackburn & Coid, 1999; Hart & Hare, 1989; Skeem, Mulvey, & Grisso, 2003).

Perhaps it is likely then, that individuals with BPD are making an informed guess at what they or others are feeling. Given the attention to NSSI in the media, and the fact that the sample consisted of undergraduate psychology students, it would then not be too difficult for participants to speculate about the generally considered appropriate emotional reactions associated with the behaviour. Another possibility might be that individuals with BPD are more vulnerable to suggestibility than individuals without BPD. This is not something which has been demonstrated in the literature, however, suggestibility is one of the DSM-IV-TR (APA, 2000) diagnostic criteria for Histrionic Personality Disorder (APA, 2000), and is also noted in individuals diagnosed with Dissociative disorders and is evident in those who have

experienced traumatic events (Vermetten, Dorahy, & Spiegel, 2007), which all share degrees of comorbidity with BPD. In addition, Paris (2002) made a comment regarding the treatment guidelines for BPD that some of these individuals may be "highly suggestible" (p. 132).

For these reasons, it would be interesting for future research to examine the process of labelling emotions in individuals with BPD in a way that uses free recall rather than recognition. Most studies to date have used recognition of emotions (e.g., Bohus et al., 2000; Brain et al., 1998a, 1998b; Chapman et al., 2005; Haines, Williams, & Brain, 1995; Haines, Williams, Brain, & Wilson, 1998; Kemperman et al., 1997). Of course, it also must be taken into consideration that there are extrapersonal influences to consider, such as the supposition that being distressed is likely to be a more socially acceptable reason for engaging in NSSI than boredom.

Although the evidence to this point may suggest that self-report data regarding the emotional experiences of individuals with BPD may need to be context of the difficulties experienced by people with BPD in identifying or recognising the nature of their emotional responses, it is still worth considering the groups' reactions to the imagery. The following section will discuss the remaining VAS results in terms of combined group reactions, because there were no differences between the BPD and NBPD groups in terms of their psychological responses to the NSSI, accidental injury and neutral scripts.

Firstly, it generally is accepted that NSSI is associated with negative emotions broadly defined as unhappiness (Chapman et al., 2006). For both groups in the current study, the NSSI script elicited more unhappiness, anger and agitation than did the accidental injury and neutral scripts. This supports the notion that the emotional

state preceding self-injury is negative, and that this negative state is resolved after engaging in self-injury. However, an examination of the psychophysiological responses for this group indicates that this pattern was not consistent with heart rate changes for individuals with BPD. A consideration of the interpersonal and emotional difficulties experienced by individuals with BPD might lead to speculation that this group would respond to self-injury with a higher level of anger than non-borderline individuals. However, although self-injury generally was associated with higher levels of anger than an accidental injury or neutral event, anger was not a distinguishing factor between the groups. This may be due to anger being frequently associated with self-injury for most individuals who engage in the behaviour (Milligan & Andrews, 2005), irrespective of their personality disorder status.

Interestingly, there was no variation in fear across the stages of the NSSI event and, overall, the ratings of fear were at a lower level of intensity. Fear is not necessarily a component of NSSI, particularly for those who have an established history of NSSI. The behaviour becomes an accepted and manageable consequence of distress and may be viewed as a solution to the problem of the experience of negative psychological and psychophysiological states (Haines & Williams, 2003). People who self-injure learn that the behaviour works rapidly and well to alleviate distress (Haines, Williams, Brain, & Wilson, 1995) and, as such, those who self-injure would have little to fear from the behaviour. Indeed, with a personal understanding of the capacity of the behaviour to relieve psychological distress, the behaviour or its consequences may be welcomed. In contrast to the need to avoid other types of injuries, some individuals may approach the behaviour anticipating a positive outcome (e.g., Favazza, 2011).

Excitement was not endorsed as an emotion associated with NSSI for either group. This is interesting if the proposition that the heart rate increase for the BPD group reflects excitement has any weight. If it does, then it might suggest that the BPD group, firstly, was unable to accurately identify the arousal increase at the incident stage of NSSI and, secondly, that the group had difficulty in accurately labelling their emotions at the time. It is possible that factors such as social desirability contributed to this finding, however, it does not explain why the BPD group did not endorse higher levels of anxiety, tension, agitation or anger at this stage when arousal was high but, instead, endorsed feelings of calm.

Dissociative experiences are a reported aspect of the processes associated with NSSI. For some, feelings of depersonalisation either coincide with or are caused by the intense distress that is experienced prior to the act of self-injury (Klonsky & Muehlenkamp, 2007; Simpson, 1975). It has been speculated that the act of self-injury serves to repersonalise the individual (Haines, Williams, & Brain, 1995; Simpson, 1975). Interestingly, a study comparing self-cutting with other forms of self-injury found that self-injury that produced bleeding was associated with both greater overall psychophysiological arousal, particularly in the lead up to self-injury, and greater feelings of unreality (Haines & George, 2008). It was postulated that the greater arousal acted as a catalyst for the dissociative state and this dissociative state allowed for the more severe self-injurious behaviour of self-cutting to be selected as a means for dealing with distress.

Certainly, depersonalisation and, to a lesser extent, derealisation were components of the self-injury experience in the current study although only to a moderate degree. Of course, other factors such as the experience of pain and pain

tolerance also may influence the association between dissociation and self-injury. The overall moderate level of endorsement of dissociative experiences at the time of self-injury in the current sample may be a reflection of some participants experiencing high levels of dissociation and no pain whereas others experience pain and tend not to experience dissociation. However, it has been previously demonstrated that low to moderate levels of dissociation were unlikely to affect psychophysiological responses to guided imagery (Williams, Haines, & Sale, 2003).

As stated, people who engage in NSSI generally are able to distinguish NSSI from actions with a suicidal intention (Walsh & Rosen, 1988). In keeping with this, the perceived risk to life identified in response to the self-injury in the current sample was generally low. However, there was a significant increase in perceived risk to life at the incident stage of the NSSI script. This may suggest that despite low levels of suicidal intent, participants still may have recognised a degree of physical risk associated with the act of engaging in self-injury.

Additionally, when examining the scores from the ISS (Pierce, 1977), the responses in the current study were similar to those in other studies investigating self-injury (e.g., Hawton, Rodham, Evans, & Harriss, 2009). It is worth noting that factors relating to the privacy of the behaviour on this scale (e.g., locked door, or an absence of notifying a potential helper) would likely result in a slightly elevated score for suicidal intent overall. However, it is widely acknowledged that NSSI tends to be behaviour which is often secretive and individuals will go to great lengths to ensure their privacy when they engage in NSSI (Walsh, 2006). Hence, for actively suicidal individuals a locked door and absence of notifying others would be associated with higher risk of suicide, but for individuals who engage in NSSI, these

factors reflect a desire for privacy rather than suicidal intent.

Interestingly, NSSI has been described as anti-suicide (see Klonsky, 2007). That is, people engage in NSSI to circumvent the more serious suicidal behaviour. However, even when they were at their most distressed, there was no evidence that the participants considered themselves to be in a situation that fundamentally risked their life. In the moments immediately preceding self-injury, it would appear that participants were not confronted with a choice about whether to suicide or self-injure. Of course, the anti-suicide notion of self-injury may still be valid but in a more general sense. It was interesting to note that despite the low perceived risk to life, the sense of perceived control over their self-injurious behaviour was only moderate and did not vary across the stages of the NSSI imagery. In this way, the participants seemed to recognise their vulnerability when engaging in an act that causes self-injury.

Summary and conclusions

In line with previous research, individuals without BPD demonstrated a clear pattern of tension reduction in response to NSSI, whereas the pattern of responding for individuals with BPD does not reflect a tension reduction function. Similarly, it would appear from these results that individuals with BPD also demonstrate a fundamental difficulty in recognising and communicating their own emotional experiences. This was evidenced by the fact that their self-report ratings of emotions experiences at the time of NSSI were not consistent with the objective psychophysiological data. It can be argued then that NSSI serves an affect regulation function for both BPD and NBPD groups although the function of this process is

clearly different for each group. In light of these results it would then seem important to examine motivational factors behind the behaviour, in order to further understand this affect regulation process.

As mentioned previously, one way to gain further understanding of these differences may be to consider the broader context of BPD symptoms. Given that NSSI is frequently regarded as an impulsive behaviour, it may then be interesting to compare NSSI with other impulsive behaviours. If the affect regulation process behind other behaviours such as binge eating or shoplifting is similar to NSSI, then this may assist with a broader understanding of the purpose that is served by engaging in these behaviours. The next few chapters will consider these factors.

CHAPTER 6

Impulsivity and impulsive behaviours

Impulsivity

NSSI is often regarded as an impulsive behaviour (e.g., Hawton et al., 1999; Herpertz et al., 1997; Ojehagen et al., 1991; Reynolds & Eaton, 1986; Sher & Stanley, 2009), yet direct comparisons of the affect regulation function of NSSI with other impulsive behaviours (e.g., binge eating) have seldom been made. Self-injurious behaviours and impulsivity are two of the DSM-IV-TR (APA, 2000) diagnostic criterion for BPD, yet individuals can engage in these behaviours without meeting the criteria for the BPD. If NSSI is to be considered as similar in its function to other impulsive behaviours, then it would seem important to examine the function of these behaviours for individuals with and without BPD.

Impulsivity is a significant characteristic in many psychological disorders, for example, Attention Deficit Hyperactivity Disorder (ADHD), Bipolar Disorder, impulse-control disorders, and personality disorders (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001), yet it tends to be a poorly defined construct (van Reekum, Links, Mitton, Fedorov, & Patrick, 1996). A broad definition of impulsivity is a "predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions to the impulsive individual or others" (Moeller et al., 2001, p. 1784). Impulsivity refers to an action that is quickly carried out without regard to the consequences of that action (Hochhausen, Lorenz, & Newman, 2002; Moeller et al., 2001; Schalling 1978). It has been suggested that although impulsivity involves risks, it is not due to the kinds of risk that are related to sensation seeking behaviours (Moeller et al., 2001). For example, research has suggested that sensation seeking tendencies are mainly due to disinhibition, specifically in relation to boredom and thrill and adventure seeking

(Teese & Bradley, 2008).

Dickman (1990) differentiated two types of impulsivity. Functional impulsivity has been described as the tendency to act without forethought in cases when the tendency to act results in a benefit to the individual. Dysfunctional impulsivity is the tendency to act without forethought in cases when this tendency is likely to be associated with a negative outcome for the individual.

A problem with much of the current literature on impulsivity is that the definitions used (e.g., Eysenck & Eysenck, 1978; Gray, 1970; Patton, Stanford, & Barratt, 1995) fail to address the role of affect, particularly negative affect which often has been associated with impulsive behaviours (Anestis, Smith, Fink, & Joiner, 2007; Brown, Lejuez et al., 2002). The role of emotional distress is important because it has the ability to alter the individual's priorities toward the immediate present. When people feel acutely bad, they often have an urgent need to feel better, and for some individuals this may mean engaging in maladaptive behaviours as a means of regulating affect (Tice, Bratslavsky, & Baumeister, 2001). It is also of importance that self-control often may fail during emotional distress (O'Guinn & Faber, 1989; Peck, 1986), which, for some individuals, would lead to engaging in impulsive behaviours. For example, it is known that people often engage in behaviours such as gambling or shopping because they believe that it will make them feel better (Dickerson, 1991; Faber, 1992; Rook, 1987).

Another problem with the research literature is that impulsive and compulsive behaviours frequently are conceptualised as the same thing. However, it would seem important to use a separate definition for these different behaviours. Moeller et al. (2001) specified that impulsive behaviour is an action in which the individual

engages without conscious effort to weigh up the consequences, whereas compulsive behaviours involve some degree of planning before the behaviour/s is carried out.

Despite the confusion it may cause, it is certainly possible that individuals who engage in impulsive behaviours may develop a compulsive response to engaging in the behaviour. For example, individuals who engage in impulsive and excessive spending may develop a problem with compulsive buying. Indeed, some behaviours best may be described as impulsive-compulsive such as impulsive-compulsive buying. In these circumstances, a pattern of arousal, pleasure and gratification appears to be involved in initiating the cycle of impulsive behaviour with the compulsive behaviour being characterised by its persistence (Hollander & Allen, 2006).

The construct of impulsivity has been criticised, because it does not consistently emerge as an independent dimension in areas of research such as trait research (Depue & Lenzenweger, 2001). There is a high degree of comorbidity between impulsivity and a range of psychiatric disorders, including Substance-Related Disorders (SRDs), Bipolar Disorder and personality disorders. In part, this can be attributed to the association between impulsivity and biological substrates of these disorders (Moeller et al., 2001). For example, frontal lobe abnormalities are often attributed to symptoms of impulsivity in personality disorders and in Bipolar Disorder (Moeller et al., 2001).

Some researchers have suggested that validation of impulsivity through biological correlates is more objective than results from studies using factor analysis and self-reports of impulsivity (Zuckerman, 2005). Certainly, the biological correlates of impulsivity are robust, and there has been consistency in the

demonstration of a relationship with brain systems that modulate inhibition (Moeller et al., 2002). In addition, studies measuring Event Related Potentials (ERPs) have identified specific waveforms relating to impulsiveness (e.g., Harmon-Jones, Barratt, & Wigg, 1997). Although ERP studies are advantageous in the sense that they directly measure brain activity, event-related potentials have been reported to be related to a variety of neurological and psychiatric conditions (Iwanami et al., 2000; Korpelainen et al., 2000) and, thus, are not a specific measure of impulsivity (Moeller et al., 2001). What appears to be important in understanding the function of impulsive behaviours is the emotional concomitants of these behaviours, and specifically, what role affect regulation may play.

Affect regulation and impulsivity

It previously has been reported that impulsiveness is an important aspect of NSSI (Herpertz et al., 1995, 1997; Simeon et al., 1992), and most theories of NSSI make reference to the difficulty that individuals have in constraining the impulse to self-injure (Lynam et al., 2011). Pattison and Kahan (1983) proposed that deliberate self-harm should be classified as an impulse-control disorder, based on the conceptualisation that individuals who engaged in the behaviour could not resist the impulse to injure themselves. Favazza and Conterio (1989) further suggested that individuals who engaged in self-injury exhibited impulsivity as noted by their lack of deliberation that occurred before engaging in the behaviour. Recent research also has indicated that individuals who engage in NSSI spend less than five minutes thinking about injuring themselves before actually engaging in the behaviour (Nock & Prinstein, 2005).

It is also of clinical relevance that people who engage in NSSI tend to engage in other impulsive behaviours. The research literature has identified that behaviours such as binge eating, alcohol and substance abuse, reckless sexual behaviour, shoplifting, and gambling (e.g., Evans & Lacey, 1992; Herpertz et al., 1997; Sansone, Lam, & Wiederman, 2011; Selekman, 2009; Zlotnick et al., 1996) are also common in individuals who self-injure.

Individuals who engage in NSSI report higher levels of impulsivity than people who do not engage in NSSI (Janis & Nock, 2009), and, in one study, self-reported impulsivity correlated with the severity and frequency of NSSI (Simeon et al., 1992). Interestingly, when completing laboratory based behavioural measures of impulsivity (e.g., gambling tasks), individuals who engaged in NSSI did not appear to demonstrate significantly higher levels of impulsivity than people who did not engage in NSSI (Janis & Nock, 2009). This finding has lead to the suggestion that individuals who engage in NSSI may only demonstrate impulsivity in certain contexts, such as when they are under extreme stress. In this way, it is possible that there is a specific relationship between NSSI and state impulsivity, but not for trait impulsivity (Glenn & Klonsky, 2010; Janis & Nock, 2009). However, it may be worth pointing out that neither of these studies specifically compared individuals with and without BPD, so it is not known if there are differences between the two groups.

However, the relationship between state impulsivity and NSSI could be explained within the context of affect regulation theory. For example, Glenn and Klonsky (2010) have suggested that individuals who engage in NSSI have a normative capacity for inhibitory control, but that the experience of negative affect

provides a context for impulsive behaviours such as NSSI to occur. Research has indicated that when individuals are in a state of heightened emotional arousal, they are twice as likely to engage in high-risk behaviours (Tice et al., 2001). In addition, if pleasure is experienced as a result of engaging in a particular behaviour, then the individual will pursue this experience again as a means of regulating affect, regardless of its level of riskiness or potential for self-destructiveness (Tice et al., 2001). It previously has been stated that engaging in NSSI provides positive feelings of pleasure and relief for some individuals (e.g., Brain et al., 1998; Chapman et al., 2006, 2010; Haines, Williams, Brain, & Wilson, 1995). Given the strongly reinforcing properties of NSSI, researchers and clinicians need to be careful about assuming that individuals who engage in NSSI actually want to resist the impulse to do so (Glenn & Klonsky, 2010).

Research is beginning to indicate that impulsive behaviours such as NSSI, binge eating, substance use and other impulsive behaviours may occur as a result of emotion dysregulation (Chapman et al., 2006, 2010; Glenn & Klonsky, 2010; Whiteside & Lynam, 2001), and that they all may share an emotion regulatory function. Core symptomatic features of impulse control disorders outlined by the APA (2000) are presented in Figure 7.

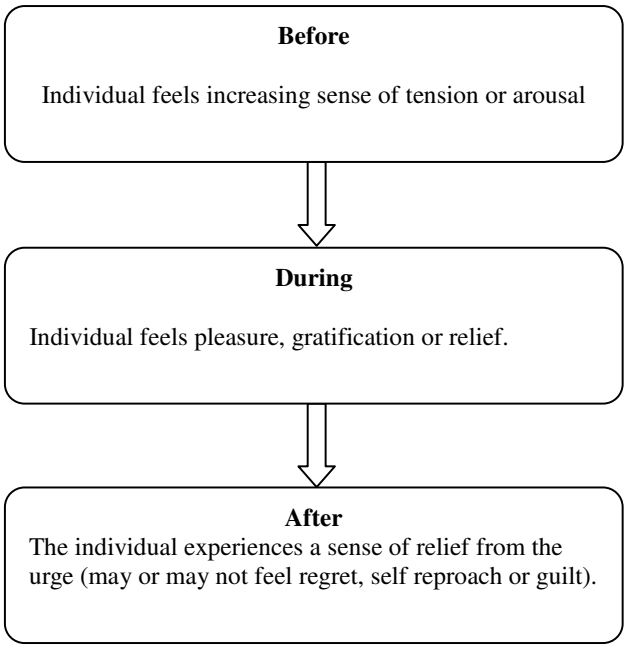


Figure 7. Core features of DSM-IV-TR (APA, 2000) impulse control disorders (APA, 2000; Hollander & Stein, 1995).

Some researchers have suggested that behaviour can be defined as impulsive if it is typified by a response involving pleasure, arousal and gratification (Hollander & Allen, 2006). In general, the research has indicated that impulsive behaviours are characterised by increased psychophysiological and psychological response before the act, pleasure, 'high' or gratification during the act, and a decrease in arousal, and feelings of guilt, remorse or other negative emotions afterwards (Hollander & Allen, 2006). It is also likely that some impulsive behaviours might be connected, particularly through cognitive processes such as rumination and a shared association with negative mood (Selby et al., 2008).

An important consideration for research is this link between emotion dysregulation and subsequent maladaptive behaviour which may serve either a

sensation seeking or self-soothing purpose, depending on the type of maladaptive behaviour in which one engages. Individuals often engage in impulsive behaviours during times when negative affect is experienced (Chapman et al., 2010; Selby et al., 2008), thereby giving priority to the short-term goal of feeling better at the risk of long-term costs (Tice et al., 2001). Whiteside and Lynam (2001) have proposed that there are four reasons why individuals engage in impulsive behaviours: sensation seeking, lack of premeditation, lack of perseverance, and urgency. Trait urgency has been found to be a factor associated with bulimia (Claes, Vandereycken, & Vertommen, 2003), alcohol abuse (Whiteside & Lynam, 2003) and BPD (Whiteside, Lynam, Miller, & Reynolds, 2005). It would appear that urgency may contribute to individuals experiencing behavioural dysregulation. Individuals who exhibit high levels of urgency also are more likely to engage in other impulsive behaviours such as reckless driving (Nesbit, Conger, & Conger, 2007), dysregulated eating (Anestis, Smith, Fink, & Joiner, 2007), and substance abuse (Anestis, Selby, & Joiner, 2007) as a result of emotion dysregulation.

The research literature has primarily focused on the role of negative urgency (i.e., urgency that occurs in the context of high arousal and negative affect) in NSSI (Lynam et al., 2011). This is based on the assumption that episodes of negative affect should increase impulsive behaviours among those who are dysregulated by such affects (Lynam et al., 2011). Negative urgency also appears to be an important construct in impulsive behaviours such as gambling and disordered eating (Anestis, Smith, Fink, & Joiner, 2007; Fischer & Smith, 2008). However, it also may be important to consider the role of positive urgency (i.e., urgency that occurs in the context of heightened arousal and positive affect) (Cyders & Smith, 2007). Taking

into the account the results from Study 1 in the current study, the role of positive urgency may have particular importance to the role of NSSI and potentially other impulsive behaviours in BPD.

Impulsivity and BPD

There are several lines of evidence that support the view that impulsivity is a core feature of BPD (Chapman et al., 2010; Paris, 2007; Zanarini et al., 2006). It has been identified that for individuals with BPD, high levels of impulsive behaviour remain stable over time (Links et al., 1999). For example, it has been stated that impulsivity in BPD is the element which helps to explain why individuals not only feel suicidal, but act on their suicidal thoughts through multiple suicide attempts (Brodsky, Malone, & Ellis, 1997; Soloff et al., 2000; Muehlenkamp, Ertelt, Miller, & Claes, 2010; Paris, 2003, 2007).

Individuals with BPD consistently score highly on all aspects of impulsivity (Links et al., 1999; Morey et al., 2002; Paris, 2004) and, in particular, they are likely to obtain high scores for trait impulsivity (e.g., Lynam et al., 2011). One study, which used questionnaire and laboratory measures of impulsivity, found that patients with BPD responded in ways to avoid longer delays on the laboratory task and obtained higher Barratt Impulsiveness Scale (Barratt, 1965) total scores than individuals without BPD (Dougherty, Bjork, Huckabee, Moeller, & Swann, 1999).

Neurobiological research has indicated that impulsivity in BPD has a strong association with abnormalities in neurotransmitter activity, primarily serotonin, as indicated from the results of challenge tests (Coccaro, 1989; Paris, 2004) and from neuroimaging studies, for example, of the anterior cingulate, amygdala, and

hippocampus (Leyton et al., 2001; Siever et al., 1999). Furthermore, neuropsychological research has suggested that individuals with BPD have frontal lobe impairments which are associated with problems with executive functioning (e.g., Arntz, 2005; Burgess, 1990; Dinn et al., 2004; Judd & Ruff, 1993; O'Leary, Brouwers, Gardner, & Cowdry, 1991; Swirsky-Sacchetti et al., 1993). In particular, some researchers have stated that individuals with BPD who demonstrate impulsive aggression may have sustained injury to the prefrontal or orbital frontal cortex (Kreisman & Straus, 2004).

In one recent study using script-driven imagery of NSSI, it was demonstrated that for individuals with BPD, imagining the act of NSSI elicited a significant decrease of activation in the mid-cingulate, but this was not the case for normal controls (Kraus et al., 2010). This further has suggested that a decrease of activation in the orbitofrontal cortex partially may explain the relationship between NSSI, impulsivity and affective instability in BPD.

Currently, genetic research is investigating the role of a serotonin transporter gene and its relationship to BPD (e.g., Lyons-Ruth et al., 2007; Pascual et al., 2008), as it appears that reduced serotonergic transmission and prefrontal dysfunction results in limbic disinhibition and these factors are among the correlates of impulsive aggression (Mauchnik, Schmahl, & Bohus, 2005). For example, one study implicated the short allele of the 5HTTLPR gene in the impulsive, self-damaging behaviours in BPD and ASPD and suggested that young adults who carry the short 5HTTLPR allele may be particularly vulnerable to developing antisocial or borderline traits (Lyons-Ruth et al., 2007).

Some researchers have suggested that BPD might best be viewed as an

'impulse spectrum disorder' (Zanarini, 1993, 1997). Other disorders also have been described as impulse spectrum disorders, including substance abuse and ASPD. Interestingly, these other impulse spectrum disorders often are the most frequently occurring disorders in first-degree relatives of BPD probands (White et al., 2003). Despite the potential overlap with other impulsive disorders, some researchers have suggested that the underlying processes associated with impulsivity in BPD are different from other impulsive disorders such as ADHD (Gunderson, 2001).

It is of interest that the focus of DSM-IV-TR (APA, 2000) criterion 4 for BPD is based on clinical observations of impulsivity rather than the actual psychological processes that underlie the self-damaging behaviours (Hochhausen et al., 2002). Researchers have proposed a range of different theories to explain the mechanisms behind impulsive, self-destructive behaviours in BPD. For example, at least one researcher has attributed impulsivity to an underlying mechanism of behavioural inhibition (Rachlin, 2000). For individuals with BPD, behavioural disinhibition is a core trait (Nigg, Silk, Stavro, & Miller, 2005; Trull & Widiger, 1991). Similarly, traits such as inattentiveness and poor planning ability have been associated with BPD (van Reekum et al., 1996).

In addition, recent research interest has focused on factors such as self-regulation, particularly the constructs of locomotion (the ability to commit the necessary psychological and physical resources for goal-oriented action) and assessment (the ability to critically evaluate a situation in order to judge its quality compared to alternatives) (Bornovalova et al., 2008). Bornovalova and colleagues (2008) proposed that poor self-regulation in the form of low locomotion and high assessment may play a role in a range of self-destructive behaviours that are

characteristic of BPD.

Some researchers have believed that impulsive, self-destructive behaviour in BPD is associated with a failure to adequately process and respond to information about the emotions that these individuals experience (Linehan & Heard, 1992; Westen, 1991). In particular, the emotion dysregulation model of impulsivity in BPD suggests that the presence (or absence) of negative emotions is perhaps associated with increased impulsivity among this group (Chapman, Leung, & Lynch, 2008). For example, Linehan's biosocial theory (1993) proposes that the types of impulsive and self-damaging behaviours observed in people with BPD occur in response to negative emotions, and may function to regulate these emotions. Hence, it would seem that the presence of negative emotions may increase the likelihood of impulsive behaviours in individuals with BPD (Chapman et al., 2008), but there remains uncertainty about whether some emotional stressors elicit more impulsivity than others (Chapman et al., 2010).

It is of interest that individuals with BPD reportedly score highly on measures of harm avoidance (Ball, Tennen, Poling, Kranzler, & Rounsaville, 1997). Harm avoidance tends to be associated with anxiety and the ability to inhibit behaviour in order to avoid punishment. In theory, this should enhance the individual's ability to learn from negative consequences (Cloninger, 1987). Other research has demonstrated that individuals with BPD perform poorly on tasks involving passive avoidance learning (PAL) (Hochhausen et al., 2002), that requires one to learn to inhibit one's behaviour in order to avoid punishment (Newman & Schmitt, 1998). Typically, participants learn to respond to a stimulus in order to obtain a reward of some kind (e.g., money), as well as to inhibit their responses in order to avoid

punishment (e.g., withdrawal of money). However, for individuals with BPD a high degree of impulsivity combined with affect regulation difficulties contributes to the reasons why these individuals continue to engage in self-damaging behaviours (Gunderson & Links, 2008).

In a study using psychopathic individuals, researchers found that trait anxiety tends to moderate the association of psychopathy and PAL. Psychopathic individuals who were low in anxiety exhibited poorer PAL than controls with low levels of anxiety, whereas psychopathic individuals with high anxiety did not exhibit poorer PAL compared to controls (Newman & Scmitt, 1998). Researchers such as Chapman and colleagues (2008, 2010) speculated that deficits in PAL in individuals with BPD may be similar to those of psychopathic individuals. This would suggest that individuals with BPD may act impulsively when they are experiencing low negative emotional states. This is similar to what other authors have described in the research literature on secondary psychopathy and highlights the overlapping traits of this subtype of psychopathy with BPD (Blackburn, 1998; Skeem et al., 2003). It may be the case that negative states relating to anxiety may have an inhibiting effect on their impulsive behaviour. It is believed that the results of PAL studies may be able to assist in explaining why individuals with BPD continue to engage in impulsive behaviours, such as risky sexual activity and substance use, despite the negative consequences they may experience (Chapman et al., 2010).

Although individuals with BPD have significant difficulties with impulsiveness, longitudinal research shows promising results in that behavioural impulsiveness is the symptom of BPD that is most likely to remit (Zanarini et al., 2006). If, for some individuals, NSSI is to be considered a problem with

impulsiveness then factors which lead to decreased behavioural impulsiveness have important implications for the treatment of NSSI. To understand the relationship between impulsivity and BPD, it may be necessary to consider the broader context of borderline symptoms.

An examination of DSM-IV-TR (APA, 2000) criterion 4 (impulsivity) and 5 (self-injury and suicidal behaviour)

It is diagnostically relevant that people with BPD engage in a range of impulsive and high risk behaviours other than self-injury (APA, 2000), such as over-spending, reckless sexual behaviour, substance abuse, reckless driving and binge eating. In general, many of these types of behaviours are considered to have an affect regulating function (Williams, 2006). However, different types of impulsive behaviours are associated with different affect regulation functions, at least in the non-borderline population.

Despite the fact that individuals with BPD engage in such a range of impulsive, self-damaging behaviours, there has been surprisingly little research conducted on the process of affect regulation that these behaviours may serve. The majority of evidence about the psychological processes associated with these behaviours is based on self-reports and clinical observations and assumptions. Indeed, many of the behaviours in which individuals with BPD are thought to engage have little to no empirical support linking them to an actual diagnosis of BPD (Selby et al., 2010). There also is little objective evidence to indicate whether or not impulsive behaviours serve the same affect regulation purpose, or a different purpose for individuals with and without BPD.

For example, binge eating has been demonstrated to function to reduce distress and bring about a sense of calm and well being (Selby, Anestis, & Joiner, 2008), at least in the short term, but it is not known whether this function serves the same purpose in individuals with BPD. Similarly, reckless sexual behaviour generally is considered to be consistent with novelty seeking (Gil, 2005) and to be a high risk and impulsive but pleasurable experience (Teese & Bradley, 2008), but research has produced little objective evidence as to whether individuals with BPD, in fact, do find these behaviours exciting.

The diverse behaviours that can be classified as impulsive are linked by their shared impulsivity and riskiness. However, it may be the case that, for people with BPD, they share other similarities. For instance, they may all stimulate the borderline individual and, in that sense, operate as a self-stimulating mechanism. Alternatively, it may be the case that some specific behaviours are used for self-soothing purposes and have an accompanying psychophysiological, tension reducing response. Some researchers have suggested that individuals who engage in NSSI may switch back and forth from NSSI to behaviours such as binge-eating, substance use and risky sex as needed (Selekman, 2009), due to the fact that they closely share the same affect regulation function (Miller, 2005). With these issues in mind, a discussion of impulsive, self-destructive behaviours which can be used to regulate the individual's affect seems warranted. Table 8 presents the range of DSM-IV-TR (APA, 2000) disorders associated with impulsivity.

Table 8

DSM-IV-TR (APA, 2000) impulse control disorders

DSM-IV-TR (APA, 2000) disorders		
Impulse-control Disorders not Elsewhere Classified	*Impulse-control Disorders not Otherwise Specified*	*Other disorders with Impulsivity*
Intermittent Explosive Disorder	Impulsive-compulsive sexual disorder	Childhood conduct disorders
Pyromania	Impulsive-compulsive self-injurious disorder	Binge eating disorder
Pathological Gambling	Impulsive-compulsive Internet usage disorder	Bulimia Nervosa
Trichotillomania	Impulsive-compulsive buying disorder	Paraphilias
		Exhibitionism
		Fetishism
		Frotteurism
		Paedophilia
		Sexual masochism
		Sexual sadism
		Transvestic fetishism
		Voyeurism
		Paraphilia not otherwise specified
		Bipolar disorder
		Attention-deficit/Hyperactivity disorder
		Substance use disorders
		Cluster B personality disorders
		Neurological disorder with disinhibition

Source: American Psychiatric Association, 2000; Hollander & Stein, 1995

Self-injury

As previously stated, it is widely recognised that self-injury is an impulsive behaviour (Evans & Lacey, 1992; Favazza & Conterio, 1989; Herpertz et al., 1997; Nock & Prinstein, 2005). Some have even conceived that individuals who engage in self-injury might be suffering from a disorder of impulse control. In fact, some

researchers have suggested that self-injury is best understood in the same class of other impulsive behaviours such as Kleptomania and Pyromania (Siomopoulos, 1974). Additionally, Trichotillomania (where the individual impulsively and/or compulsively pulls out hair from his/her head, eyelashes, eyebrows or other areas of the body) is often reported as a form of self-injury and is included as an impulse control disorder in the DSM-IV-TR (APA, 2000). Additionally, under Impulse-Control Disorder Not Otherwise Specified in DSM-IV-TR (APA, 2000) there is the example of skin picking (APA, 2000, p.677) which also could be classified as self-injurious in nature (Ross & McKay, 1979).

Despite the fact that self-injury is considered an impulsive behaviour, there is no formal definition of a time-frame which successfully provides an indication of an impulsive act. However, several researchers have made suggestions which range anywhere from less than fifteen minutes to three hours in contemplation between the precipitant and the act (Barnes, 1985; Hawton et al., 1999; Ojehagen et al., 1991; Reynolds & Eaton, 1986). Other researchers simply have defined impulsiveness as reflecting no contemplation of the behaviour at all. This means that the literature demonstrates conflicting results about definitional issues related to impulsivity and NSSI. Some researchers have suggested that the term impulsivity tends to be used ambiguously in this area of research. For example, in labelling self-injury as an impulsive behaviour the term impulsive may be used in the context of a behaviour that, in fact, is not carried out on the spur of the moment and with no premeditation (Paris, 2007).

Some researchers have postulated that when perceived levels of distress increase, individuals who engage in NSSI are reportedly unable to control impulsive

actions (Bennum, 1983). Although individuals who engage in NSSI may initially attempt to resist the impulse (Feldman, 1988a; Pao, 1969; Simpson, 1976), the behaviour becomes a habitual response to negative emotions (Walsh & Rosen, 1988). Some studies have suggested that self-reports indicate that 70% -78% of people who engage in NSSI possess little or no control over their behaviour (Bennum, 1983; Favazza & Conterio, 1989). As stated previously, a similar relationship between negative affect and a perceived inability to resist the urge to engage in impulsive behaviour has been demonstrated for individuals who engage in gambling (Fischer & Smith, 2008).

Gambling

There is evidence to suggest that as many as 1-3% of the general population engage in pathological gambling (Frost, Meagher, & Riskind, 2001; Grant & Potenza, 2004). In order for gambling to be classified as pathological or self-destructive, there would need to be evidence that the consequences of the behaviour cause distress for the individual, and/or that there is evidence of disruption in personal, family, or vocational pursuits (APA, 2000, p.671).

It has been suggested that individuals who engage in pathological gambling may be highly competitive, energetic, restless and prone to boredom (Schmitz, 2005). In relation to this, there is ample research evidence to indicate that gambling serves an affect regulation function. For example, research has demonstrated that seeking a sense of excitement and euphoria is paramount to the experience of gambling and that this may be used to escape or distract from feelings of depressed mood (Schmitz, 2005). These subjective feelings of increased arousal also are

supported by findings of increased heart rate and other psychophysiological responses (e.g., Coventry & Constable, 1999). Some researchers have reported that participants demonstrate increases in heart rate of up to 22 beats per minute while engaged in slot-machine gambling (Griffiths, 1991). Researchers have indicated that there are changes in arousal level before, during and after gambling for those individuals who are winning but that changes are less evident for individuals who are losing (Coventry & Constable, 1999).

It then would appear that the experience of winning and/or the anticipation of that experience may be what contributes to these increases in heart rate, rather than the general experience of engaging in gambling itself (Coventry & Constable, 1999). Individuals often need to gamble with increasing amounts in order to maintain feelings of excitement or gratification (Grant & Kim, 2003). Similarly, individuals who engage in chronic NSSI may increase the frequency and severity of the behaviour over time in order to achieve the same desired effects (Walsh, 2006). For individuals with BPD, it may be the case that the desire for heightened arousal (e.g., to relieve boredom) leads to increases in the frequency or severity of impulsive behaviours (e.g., gambling larger amounts of money, or cutting deeper) in order to achieve this arousal.

It has also been suggested that there may be some differences in responses to gambling between pathological and non-pathological gamblers. A study of video lottery gamblers found that pathological and non-pathological gamblers demonstrated similarities in psychophysiological responses, but that pathological gamblers reported greater levels of subjective excitement (Diskin & Hodgins, 2003). Seeking a state of euphoria often is more important to the pathological gambler than

is the desire for money (Schmitz, 2005).

In addition, one study found that gamblers who had a co-occurring impulse control disorder (e.g., compulsive sex) demonstrated more frequent thoughts about gambling and urges to gamble than those gamblers who did not meet the criteria for an impulse-control disorder (Grant & Kim, 2003). In a study specifically examining pathological gambling and comorbid compulsive sexual behaviour (CSB), nearly one-fifth (n = 225) of pathological gamblers had a co-occurring diagnosis of CBS, and 70.5% of individuals reported that CSB preceded their gambling symptoms (Grant & Steinberg, 2005). This may indicate that gambling and CSB share a similar affect regulatory function. Gambling and CSB may also share similarities with behaviours such as excessive spending, in that excessive spending also appears to be associated with a desire for excitement and feelings of heightened arousal to relieve boredom (e.g., Clark & Calleja, 2008; Faber, 2000; Faber & Christenson, 1996).

Excessive spending

Buying, shopping or spending that is out of control and creates personal, financial and family problems has gained increased interest as an impulsive behaviour over the last few years (Billieux, van der Linden, & Rochat, 2008; Dell'Osso, Allen, Altamura, Buoli, & Hollander, 2008). This behaviour also has been referred to by different authors as compulsive shopping (e.g., Koran, Bullock, Hartston, Elliott, & D'Andrea, 2002), compulsive buying (Faber, 1992, 2000; Schmitz, 2005), addictive buying (Scherhorn, Reisch, & Raab, 1990), uncontrolled buying (Lejoyeux, 1996) excessive buying (Dittmar, 2000) and 'spendaholism' (Campbell, 2000). Although none of these behaviours are specifically included in

the DSM-IV-TR (APA, 2000) category of Impulse Control Disorders, a residual category under Impulse Control Disorders Not Otherwise Specified allows a DSM-IV-TR (APA, 2000) diagnosis to be made within a residual category (APA, 2000). Criterion 4 for BPD (impulsivity) also refers to 'spending' as an example of a potential self-damaging impulsive behaviour, yet there is little empirical evidence to support this association. Only one study has recently indicated that there is a relationship between BPD and impulsive spending (Selby et al., 2010).

Despite the lack of formal inclusion in the DSM-IV-TR (APA, 2000) the research literature has given considerable attention to this behaviour. Although data on the prevalence rates for excessive and/or compulsive spending are vague, research has estimated the lifetime prevalence of compulsive buying to be 2-8% (Koran et al., 2002; Schmitz, 2005), with women more affected than men (Schmitz, 2005). The average age of onset is estimated at 17.5 years, but the average age at which compulsive buying is recognised as a problem is 29.5 (McElroy, Phillips, & Keck, 1994).

The research literature frequently has identified the affect regulatory function of excessive and/or compulsive buying where individuals use shopping as a means of elevating mood (e.g., Clark & Calleja, 2008; Faber, 2000; Faber & Christenson, 1996). Some researchers have stated that the impulses that drive compulsive buying are ego-syntonic, meaning that the act of engaging in buying is a pleasurable one for most individuals. However, as mentioned previously, DSM-IV-TR (APA, 2000) stipulates that compulsions generally serve to reduce anxiety and are not for pleasure or gratification. Thus, some authors have defined compulsive buying by its capacity to become a chief response to stress and negative events (Faber, 1992; O'Guinn &

Faber, 1989). O'Guinn and Faber (1989) also suggested that the motivation for compulsive buying appears to be associated with a desire to feel better rather than a strong desire to possess things (O'Guinn & Faber, 1989). In a similar pattern to other impulsive behaviours, there is evidence to suggest that pleasant emotions associated with shopping seem to mask negative emotions but that this only lasts for a short time, before negative feelings return, thus perpetuating the compulsive buying cycle (Clark & Calleja, 2008).

Individuals who engage in compulsive buying experience consistent urges to buy things, and these urges last for approximately one hour and may occur daily to weekly according to one report (Christenson et al., 1994). Approximately 90% of individuals try to resist the urge to buy, but will often end up completing the purchase within 1-1.5 hours (Rook, 1987). The research also has indicated that individuals prefer to shop alone when they engage in compulsive buying and that they are likely to buy items such as DVDs, clothing, jewellery, cosmetics and household items (Christenson et al., 1994).

One study assessed different components of compulsive buying using the UPPS Impulsive Behaviour Scale (Whiteside & Lynam, 2001), which identifies four distinct components associated with impulsive behaviours including urgency, lack of premeditation, lack of perseverance, and sensation seeking. Results indicated that compulsive buying was positively correlated with three facets of impulsivity, namely, urgency, lack of perseverance and lack of premeditation. In addition, the authors found that urgency was the only significant predictor of compulsive buying tendencies when factors of gender, age, education and depression were controlled for (Billieux et al., 2008).

In terms of comorbidity, the research literature has indicated that anxiety disorders, eating disorders, substance use disorders, and other impulse control disorders are frequent among individuals who engage in compulsive buying (Christenson et al., 1994; Faber, 2000). In addition, one study found that 15% of individuals who engaged in compulsive buying met the criteria for BPD (Schlosser, Black, Repertinger, & Freet, 1994).

Despite similarities in the affect regulation function shared by behaviours such as gambling and excessive spending, research has indicated that not all impulsive behaviours can be attributed to an increase in arousal. For example, binge eating has been reported to serve a self-soothing function whereby the individual uses binge eating to relax by temporarily reducing feelings of heightened negative arousal (e.g., Agras & Telch, 1998; Stice & Agras, 1999; Telch & Agras, 1996).

Binge eating

Binge eating refers to a specific form of overeating in which the feeling of loss of control over eating rather than the actual amount of food consumed is paramount (Fairburn & Wilson, 1996). Binge eating may manifest as part of an eating disorder and often presents in combination with a wide range of psychopathology (Fairburn & Wilson, 1996). Individuals may engage in binge eating without necessarily meeting the diagnostic criteria for a disorder. Although the literature makes reference to Binge Eating Disorder (BED), the DSM-IV-TR (APA, 2000) only includes BED in the appendix as a disorder for further study.

Under the criteria for Bulimia Nervosa (BN), DSM-IV-TR (APA, 2000) defines a binge as “eating in a discrete period of time an amount of food that is

definitely larger than most individuals would eat under similar circumstances" (p.589). It appears that there is a high degree of overlap between BED and BN and the binge eating behaviours of both disorders are phenomenologically identical (McElroy, Keck & Phillips, 1995).

Binge eating is generally thought to function as a means of altering negative emotional states (Mitchell, Devlin, de Zwaan, Crow, & Peterson, 2008; Stice & Agras, 1999). It also is reportedly the most common behaviour that individuals who engage in NSSI will use as an alternative to self-cutting (Selekman, 2009). Approximately 35-60% of females who engage in NSSI also will experience symptoms of Bulimia (Conterio et al., 1998; Dohm et al., 2002; Favaro, Ferrara & Santonastaso, 2003; Paul et al., 2002; Whitlock et al., 2006).

Binge eating is typically triggered by dysphoric mood and interpersonal stressors (APA, 2000). Binge eating, in general, also tends to be associated with Major Depressive Disorder (McElroy et al., 1995; Vollrath, Koch, & Angst, 1992). It has been suggested that individuals who engage in binge eating use this behaviour to avoid negative emotions by diverting attention away from negative feelings and focusing on the physical stimuli and processes associated with eating (Agras & Telch, 1998; Heatherton & Baumeister, 1991; Stice & Agras, 1999; Telch & Agras, 1996). Some researchers have stated that anxiety is the most common emotion preceding binge eating (Agras & Telch, 1998; Binford, Mussell, Peterson, Crow, & Mitchell, 2004).

Binge eating may transiently reduce dysphoria, but depressed mood, guilt and self-criticism are likely to re-emerge shortly after the binge occurs (APA, 2000). Hence, there is research evidence to suggest that engaging in binge eating does not

actually accomplish lasting mood change, even though people tend to believe that it does (Thayer, Newman, & McClain, 1994). In terms of BPD, there is clearly a relationship between this and binge eating (Selby et al., 2010), however, the affect regulatory function of binge eating in BPD remains unclear (McElroy et al., 1995).

Other impulsive behaviours also may function as a means of reducing heightened arousal, thereby producing self-soothing effects. For example, the research literature indicates that, for at least some individuals, engaging in risky sexual activities may serve to reduce anxiety and tension (e.g., Coleman, 1992; Kalichman, Greenberg, & Abel, 1997; Schaffer & Zimmerman, 1990).

Risky sexual activity

Risky sexual behaviours may include unprotected sex, anonymous sex, or sex with multiple partners (Pinkerton & Abramson, 1992). Impulsivity and perceived benefits often predict the likelihood of an individual engaging in reckless sexual behaviour (Teese & Bradley, 2008). Interestingly, Pinkerton and Abramson (1992) argued that the majority of individuals who engage in risky sexual behaviour are not uninformed about the risks but have interpreted the available information (e.g., AIDS awareness campaigns) and concluded that risky sex is a reasonable gamble to take.

Risky sexual behaviours also may include a range of other related behaviours that are compulsive in nature, namely compulsive sexual behaviour (Coleman, 2003; Quadland, 1985) or addictive sexual behaviour (Carnes, Murray, & Charpentier, 2005; Goodman, 1993), paraphilia-related disorder (Kafka & Prentky, 1994) and sexual impulsivity (Barth & Kinder, 1987). There is no universally accepted definition of compulsive sexual behaviour, although the term can be used to indicate

uncontrolled or excessive cognitions or behaviours which lead to distress, social and/or occupational difficulties and legal and/or financial difficulties (Black, Kehrberg, Flumerfelt, & Schlosser, 1997).

Often, the research literature has discussed compulsive sexual behaviour with reference to paraphilias (e.g., exhibitionism), however, Coleman (1992) outlined five subtypes of nonparaphilic compulsive sexual behaviours: (1) compulsive 'cruising' and pursuit of multiple partners, (2) compulsive fixation on an unobtainable partner, (3) compulsive masturbation, (4) compulsive 'multiple love' relationships, and (5) compulsive sexuality within a relationship. Compulsive behaviours generally are perpetrated with the goal of reducing anxiety or distress (Guigliamo, 2006). Goodman (1998) argued that several of the behaviours seen in compulsive sexual behaviours may involve pleasure seeking rather than a desire for tension reduction, which would make them more consistent with the definition of impulsive behaviour.

The tension-reducing motivations behind risky or compulsive sexual behaviour have been well documented (e.g., Coleman, 1992; Kalichman, Greenberg, & Abel, 1997; Schaffer & Zimmerman, 1990), thus, the behaviour can be described as serving an affect regulatory function. Indeed, Williams (2006) suggested that the main function of the activity is not sexual at all, but serves an affect-regulatory and defensive purpose. One study found that depression was a significant predictor for engaging in risky sexual behaviours, particularly for young women (Paxton & Robinson, 2008)

However, other authors have described the behaviour as an example of an absence of self-control (Quadland, 1985) and argued that it does not necessarily cause the individual any distress (Allen & Hollander, 2006). Perhaps a better

definition is that provided by Goodman (1993) who suggested that the behaviour can function both to produce gratification and to provide escape from unpleasant emotions. Interestingly, it is worth noting that the DSM-IV-TR (APA, 2000) specifically states that a behaviour cannot be for pleasure or gratification if it is to be considered compulsive (APA, 2000). This then would make several definitions of compulsive sexual behaviour fundamentally flawed (Guigliamo, 2006).

The research evidence has indicated comorbidity between compulsive sexual behaviour and Anxiety Disorders, Major Depressive Disorder, and substance use problems (Allen & Hollander, 2006; Coleman, 1992; Miller, Abrams, Dulit, & Fryer, 1993). Endorsement of other impulsive behaviours also is common, with one study reporting compulsive buying, Kleptomania, Pathological Gambling and Pyromania as the most frequently endorsed behaviours or conditions (Black et al., 1997). Associated difficulties include unwanted pregnancies, sexually transmitted infections, somatic complaints, sexual dysfunction and relationship difficulties (Black et al., 1997; Coleman, 1992; Sansone, Barnes, Muennich, & Wiederman, 2008).

In the BPD population, the explicit inclusion of these sexual behaviours within the diagnostic criteria reflects the high incidence of this problem within this population (Williams, 2006). A small number of studies have examined the role of risky sexual behaviour in BPD, but with mixed results (e.g., Daley, Burge, & Hammen, 2000; Hull, Clarkin, & Yeomans, 1993; Lavan & Johnson, 2002; Selby et al., 2010; Zanarini et al., 2003). For example, one study compared women with BPD to a sample of non-personality disordered women and found that women with BPD demonstrated higher sexual self-esteem, more sexual assertiveness, and a higher

likelihood to actively seek out sexual activity. In addition, women with BPD were more likely to have been sexually abused in childhood, to be more preoccupied with sexual thoughts and to have greater levels of dissatisfaction with their sex lives (Hurlbert, Apt, & White, 1992).

Other studies have examined the presence of 'sexual acting out' in women with BPD. For example, Hull et al. (1993) reported that 46% of women with BPD in their sample had entered into a sexual relationship with people who they did not know well. It also has been suggested that for individuals with BPD, engaging in risky sexual activity may be related to alexithymia and difficulties with mentalisation and self-soothing (Williams, 2006). This relationship is complicated even further by the fact that a large proportion of individuals have experienced a long history of sexual abuse and attachment problems (e.g., Bryer et al., 1987; Herman et al., 1989). Childhood sexual abuse often is associated with sexual impulsivity, most commonly promiscuity in BPD. For example, in a meta-analysis of 37 studies involving over 25,000 participants, Oddone-Paolucci, Genuis, and Violato (2001) found that sexual abuse in childhood was associated with promiscuity in adulthood.

Certainly, the DSM-IV-TR (APA, 2000) acknowledges a relationship between BPD and sexual impulsivity, and it would seem logical that BPD is associated with childhood maltreatment and impulsivity in adulthood (Sansone et al., 2008). Despite this, the empirical literature investigating BPD and sexual impulsivity is sparse, and includes small sample sizes. Pelsser (1989) described an individual with BPD who demonstrated sexual promiscuity. Similarly, O'Boyle (2002) reported sexual promiscuity among four females diagnosed with BPD. One study classified 71 female participants as 'low risk' versus 'high risk' according to their sexual

behaviour and suggested that those in the high-risk group were significantly more likely to be diagnosed with BPD (Allan, 1998). In another study with 71 female inpatients with BPD, Hull et al. (1993) found that 46% had entered into sexual relationships with individuals who were not well known to participants. In addition, Miller et al. (1993) found that substance abuse in BPD was associated with promiscuity.

Despite this research, it is of interest to note that Zanarini et al. (2003) found that nearly one-third of patients with BPD reported sexual avoidance and actually feared that sex would exacerbate their symptoms. Also, nearly two-thirds of the sample reported some type of sexual relationship 'difficulty', which was not described by the authors.

Research also has begun to investigate the overlap between the symptoms of BPD and the symptoms of sexual addiction and compulsivity. Recently, research has begun to consider the possibility that BPD symptoms of instability in relationships and affect can be used to explain some of the behaviours associated with compulsive sexual behaviour, such as a need for multiple partners (Lloyd, Raymond, Miner, & Colemanc, 2007). For example, individuals with both conditions seem to struggle with intimacy and relationships, and may use sexual 'acting out' as a way of coping with feelings of loneliness and emptiness (Rickards & Laaser, 1999).

In a discussion of Axis II presentations, Montaldi (2002) referred directly to an affect regulatory function of Compulsive Sexual Behaviours (CSB) and 'hypersexuality' in BPD. Specifically, he described a pattern of behaviour where individuals seek out sexual contacts as a means of changing one's emotional state and coping with feelings of emptiness. He further suggested that the pursuit of

multiple partners reflects the fact that the individual with BPD demonstrates an existential pattern of behaviour in that s/he is constantly searching for a perfect or idealised form of love with someone who will 'rescue' him/her.

One study which exclusively investigated the role of risky sexual behaviour in BPD suggested that there are differential diagnostic features which delineate three specific BPD groups: those individuals without BPD who are sexually addictive/compulsive, individuals with BPD who are sexually addictive/compulsive, and those individuals with BPD who may act-out sexually but who are not sexually addictive/compulsive (Rickards & Laaser, 1999). Rickards and Laaser (1999) described sexually addictive/compulsive individuals as using their sexual behaviour both within and outside of a relationship, frequently engaging in anonymous one-night stands. These individuals usually have a sense of strategic planning in their behaviour in the sense that they actively plan to 'seduce' or 'conquer' a potential partner. They also will use sex as a mean of 'getting revenge' or retaliating from a perceived slight or sense of abandonment. Rickards and Laaser (1999) suggested that for these individuals, sexual behaviour is frequently associated with rage and power.

On the other hand, the non-sexually additive/compulsive individuals with BPD engage in sexual 'acting out' restricting their behaviour to impulsive, brief and illusory affairs that appear to have no agenda. Rather than an act of revenge, Rickards and Laaser (1999) suggested that for non-sexually compulsive individuals with BPD, risky sexual activity represents a desire for love and acceptance.

With these differences in mind, it is possible that risky sexual behaviour may serve different affect regulatory purposes according to whether the individual's

behaviour can be identified as compulsive or not. It has been suggested that the goal of impulsive behaviour is to experience pleasure, whereas the motivation behind compulsive behaviour is to prevent or reduce anxiety and/or subjective feelings of discomfort (Giugliamo, 2006). This is something which further research needs to address, and certainly Rickards and Lasser (1999) suggested that these differences are important, and failure to recognise them may lead to ineffective treatment strategies. Similarly, Sansone et al. (2008) suggested that sexual impulsivity per se is not a very specific criterion for the diagnosis of BPD, and requires further refinement and should be augmented with other clinical features to conclude the diagnosis of BPD.

For other impulsive behaviours, the affect regulatory function behind these behaviours is quite complex. For example, it is widely recognised that individuals engage in substance for the purposes to altering mood (APA, 2000), however, different substances are likely to serve different affect regulation purposes. This also is likely to be influenced by factors such as comorbid psychopathology. The following section will attempt to address some of these issues.

Substance use

A range of models have been put forth in an attempt to explain the relationships that exist between substance use and psychopathology (for a review, see Mueser, Drake, & Wallach, 1998). One of the main theories proposes that individuals who have high levels of sensation seeking experience low basal level arousal and high anhedonia, and this would make them more motivated to engage in substance use to achieve an optimal level of stimulation (Zuckerman, 1994). In contrast,

another theory proposes that the presence of psychopathology increases the risk for developing a substance use problem (Mueser et al., 1998). Typically, the self-medication hypothesis (see Khantzian, 1997) is used as an explanation for why individuals with psychopathology may use substances. In this view, drug use and abuse is motivated by a desire to relieve psychological distress.

It is likely that individuals with different types of psychopathology will be attracted to different substances, depending on the function that they serve. Generally speaking, it makes sense that individuals who experience high arousal may be attracted to substances that would lower their arousal such as cannabis or benzodiazepines, whereas individuals who have high sensation seeking traits would be likely to use stimulants such as methamphetamines or MDMA. However, there also are individuals (typically polysubstance users) who demonstrate paradoxical reactions to substances (e.g., finding that cocaine has an inhibitory rather than excitatory effect) (Wiers, Houben, & de Kraker, 2007).

Affect dysregulation is believed to be related to addictive behaviours, such as substance use and individuals who demonstrate poor ability to regulate their own emotions supposedly are more vulnerable to developing addictive disorders (e.g., Taylor et al., 1997). For example, there is substantial evidence to suggest that many individuals with BPD also meet the diagnostic criteria for Substance-Related Disorders (SRDs) and alcohol abuse (Feske, Tarter, Kirisci, & Pilkonis, 2006; McMain, Sayrs, Dimeff, & Linehan, 2007; Trull, Sher, Minks-Brown, Durbin, & Burr, 2000; Zanarini et al., 2011). It also apparent is that SRDs are prevalent in those individuals with BPD regardless of whether participants are from inpatient, outpatient or community settings (Trull et al., 2000).

In a review of research articles reporting on co-occurring BPD and SRDs from 1987 to 1997, Trull and colleagues (2000) found that 275 of 479 participants with BPD received an additional SRD diagnosis (57.4%). In addition, 265 of 605 participants with BPD met the diagnostic criteria for alcohol abuse (48.8%). In a recent longitudinal study, it was reported that in comparison to other Axis II disorders, individuals with BPD were 65% more likely to report any substance abuse/dependence and 52% more likely to report both alcohol and drug abuse/dependence (Zanarini et al., 2011). Individuals who experience the combination of BPD and SRDs demonstrate an increased risk for other self-damaging behaviours such as participation in the sex trade, more frequent and serious drug overdoses, and increased risk for suicide (Feske et al., 2006).

This indicates that substance abuse is a significant problem in the BPD population, which makes it an important target for treatment. Interestingly, however, a recent finding from the Zanarini et al. (2011) study indicated that over 90% of individuals with BPD who met the diagnostic criteria for SRDs at the beginning of data collection experienced remission by the time of the 10-year follow-up. It was the view of Zanarini and colleagues (2011) that many of these individuals probably experienced substance abuse (e.g., episodic periods of disordered drinking), which they suggested may result in less severe outcomes than for those individuals with substance dependence.

Zanarini and colleagues (2011) further have suggested that with regard to patterns of substance use, there may be three subtypes of individuals with BPD. Firstly, there are individuals with BPD who have never had a substance use problem, there are individuals who experience a time-limited problem that they are able to

overcome, and finally, there are those individuals with intermittent problems with alcohol and substances.

Considering that substance abuse may be episodic in individuals with BPD it would seem important to consider potential triggers. Research has indicated that triggers for substance abuse in individuals with BPD are associated with high levels of subjective distress, including symptoms of depression, hopelessness and anxiety, as well as emptiness and boredom (Feske et al. 2006; Zanarini et al., 1998). This indicates that treatment for SRDs in BPD may need to take into consideration the possible range of affect regulation functions behind the individual's substance use. For example, it may be important to consider whether the purpose of substance use is aimed at decreasing arousal (due to feelings of distress), or increasing arousal (due to feelings of emptiness or boredom).

In addition to substance use, risky sexual activities, binge eating and excessive spending, another impulsive behaviour which has received relatively little research attention is reckless driving. The following section aims to establish whether or not a relationship can be found between NSSI and reckless driving in the existing research literature, and, what specific affect regulation function reckless driving might serve.

Reckless driving

Reckless driving (also referred to as aggressive or dangerous driving) encompasses a wide continuum of behaviours. It can refer to illegal practises such as speeding, driving while intoxicated or without a licence, or it can refer to incidents of discourtesy or road rage with other drivers. Some researchers have suggested that

reckless driving can encompass anything from making gestures and having arguments with other drivers through to severe manifestations such as shootings (Ward, Simpson, Mayhew, & Robertson, 2008).

Generally speaking, the majority of individuals who engage in reckless driving are young men (Blockley & Hartley, 1995; Ozkan & Lajunen, 2005). Young male drivers (i.e., 26 and younger) are more likely to take risks (Deery, 1999), use seat belts less often (Jonah 1997) and engage in speeding and other forms of traffic violation more often than older age groups (Blockley & Hartley, 1995; Jonah, 1997). One study indicated that factors such as perceived risk and perceived benefits were able to predict the likelihood of individuals engaging in reckless driving (Teese & Bradley, 2008).

From an affect regulation perspective, research has indicated that there is a significant, positive relationship between anger and aggressive driving (e.g., Nesbit et al., 2007). There is little research evidence to indicate whether or not reckless driving is a behaviour which serves to reduce tension, or whether it is more akin to sensation seeking. However, it makes sense that individuals may engage in reckless driving to relieve boredom and, thereby, produce feelings of heightened arousal.

Aggressive driving also has been associated with BPD (Galovski, Blanchard, & Veazey, 2002; Selby et al., 2010). However, the specific affect regulatory function of reckless driving in BPD is poorly understood and requires further research (Selby et al., 2010).

Another impulsive behaviour which has received surprisingly little research attention in the last decade is shoplifting. The following section will review the available literature on shoplifting and examine the possible affect regulatory function

of this behaviour.

Stealing/shoplifting

Shoplifting constitutes a significant social problem, yet it has rarely been the subject of extensive scientific research (Blanco et al., 2008). Typically, research has tended to focus on economical and social factors rather than psychological ones (e.g., Babin & Babin, 1996; Klemke, 1978; Krasnovsky & Lane, 1998). According to one recent study, as many one in eleven individuals have engaged in shoplifting at some point (Blanco et al., 2008), and most of these individuals are female (Ray, 1987). There is evidence to suggest that most shoplifting behaviour is spontaneous and impulsive (Schlueter, O'Neal, Hickey, & Sellers, 1989), and most individuals who engage in shoplifting do not suffer from mental illness (Freedman, Marks & Dalgleish, 1996).

However, shoplifting has been linked to psychopathology in a number of studies, and it is estimated that 3-5% of individuals who engage in shoplifting have a DSM-IV-TR (APA) diagnosis (Blanco et al., 2008). The most common diagnoses reported in the literature are Major Depressive Disorder, Bipolar Disorder, eating disorders and ASPD (e.g., Blanco et al., 2008; Nagata et al., 1999; Selby et al., 2010; Suzuki et al., 1994). In addition, shoplifting has been linked to substance abuse in that there is evidence to suggest that shoplifting may be precipitated by the effects of alcohol or drugs (Bradford & Balmaceda, 1983; Moore, 1984). Clearly, it also may serve as a means of financing the purchase of drugs for individuals with substance use problems (Hetu, Lamontagne, Lacerte-Lamontagne, & Carpentier, 1994).

Shoplifting also is linked to Kleptomania, which, in its true form, is a rare

psychiatric disorder characterised by a compulsive and recurrent failure to resist the impulse to steal items that are not of any real value to the individual (APA, 2000). Given that less than 5% of shoplifters will actually suffer from true Kleptomania (APA, 2000; Schmitz, 2005), an in depth discussion of this particular disorder is beyond the scope of the current review.

The tension-relieving properties of shoplifting behaviour have been documented elsewhere by a number of researchers (e.g., Fishbain, 1987; Gudjonsson, 1987; McConaghy & Blaszczynski, 1988; McElroy, Hudson, Pope, & Keck, 1991). Certainly, it would seem that an understanding of shoplifting must account for stress (Blanco et al., 2008; McShane & Noonan, 1993; Ray, 1987). In the absence of personal gain, shoplifting may represent a maladaptive coping strategy (Selby et al., 2010).

Despite reports of psychopathology in some individuals who engage in shoplifting, there has been very little research attention given to the role of shoplifting in BPD. This is somewhat surprising given the fact that shoplifting may form part of DSM-IV-TR (APA, 2000) criterion 4 for impulsive behaviours. There is some evidence of a high prevalence of personality disorders in individuals who engage in stealing (Grant, Levine, Kim, & Potenza, 2005; Nagata et al., 1999; Suzuki et al., 1994), however, this is not an area that has been researched extensively. One recent study indicated that there is a relationship between stealing or shoplifting and BPD (Selby et al., 2010). In addition, a recent questionnaire study indicated that those participants who reported that they engaged in shoplifting had significantly higher scores on both the BPD scale of the Personality Diagnosis Questionnaire Revised (Hyler & Rieder, 1987) and the Self-Harm Inventory (Sansone, Wiederman,

& Sansone, 1998) than did participants who denied ever having shoplifted. This indicates that there is an association between BPD and shoplifting, but again this requires further empirical support.

It previously has been stated that anger is an important component of BPD (APA, 2000). It may be of clinical interest then that shoplifting has been linked to anger and operant motivations such as a sense of entitlement (Shulman, 2003). However, this association has not yet been explored extensively in the research. Similarly, another impulsive behaviour which has not received extensive research attention that appears to be related to anger is impulsive damage to property.

Impulsive damage to property

Acts of impulsive aggression commonly are associated with individuals who are diagnosed with personality disorders, namely, BPD and ASPD, and with individuals who engage in self-injury (Schmitz, 2005). Impulsive damage to property is one example of an expression of this impulsive aggression. Property damage appears in the DSM-IV-TR (APA, 2000) as part of criterion A for Intermittent Explosive Disorder (IED), which falls under the category of Impulse Control Disorders Not Elsewhere Classified. The DSM-IV-TR (APA, 2000) states that property destruction entails "purposeful breaking of an object of value; minor or unintentional damage is not of sufficient severity to meet this criterion" (p. 663). A diagnosis of IED is made only after other disorders which could account for aggressive behaviour have been ruled out (e.g., BPD). The DSM-IV-TR (APA, 2000) also requires that aggressiveness is "grossly out of proportion to any precipitating psychosocial stressor" (p.663-664).

Considering the affective instability and anger symptoms associated with BPD, it makes sense that these individuals may be likely to break or destroy items or property when angry (Millon, 2000). However, there has been very little research attention given to this area. As mentioned previously, Albrecht and Porzig (2003 in Ebner-Priemer et al., 2008) stated that heightened physical activity during episodes of psychological distress is an important feature of BPD. For these individuals, the experience of tension appears to involve a high degree of attention towards physical aspects such as breathing, physical numbness, depersonalisation, 'feeling torn', and feeling like one is 'ready to explode' (Stiglmayr et al., 2008).

Clinical observations of BPD symptoms would suggest that many individuals with BPD engage in impulsive damage to property, and one study has linked 'breaking things' as a dysregulated behaviour associated with BPD (Selby et al., 2010). Individuals who do not feel in control of their internal emotional state, not only those with BPD, may believe that unwanted physiological sensations from anger or other emotions can only be relieved by engaging in some kind of physical activity, such as, smashing plates or breaking items (Preston, 2006; Vaughan & Salzman, 1996). It frequently is thought that in human evolutionary past, violent activity naturally followed the arousal from the fight or fight response (Brunner, 2000; Steptoe & Willemsen, 2002). Hence, it may be the case that when there is pent up anger, individuals may feel the need to engage in some physical action to reduce adrenalin associated with the fight or flight response. However, adrenalin typically only stays in the bloodstream for a few minutes meaning that physical activity does not necessarily play a vital role in restoring parasympathetic nervous system response (Bartley, 2004).

For individuals with BPD, the contributing factors of affective instability, low frustration tolerance, relationship difficulties and inappropriate anger may contribute the choice of a physical outlet for anger that is destructive. For example, there are anecdotal reports of individuals with BPD engaging in behaviours such as impulsively burning photos and other reminders of the relationship, smashing plates, punching holes in walls, or damaging a partner's car. These kinds of behaviours are not only physically self-destructive in that they could cause injury, but are emotionally damaging both to others and to the individual. After engaging in property damage, the individual may regret the fact that valuable items have been destroyed, and feel a further sense of being out of control. This notion would fit with the research evidence suggesting that individuals with BPD experience prominent feelings of shame and guilt (Crowe, 2004; Rüsch et al., 2007).

In addition, impulsive damage to property may include minor acts of damage to one's own or someone else's property, through to more serious behaviours such as fire-setting, which may be accompanied with a diagnosis of Pyromania. Fire-setting is a relatively common act of aggression perpetrated by young children, particularly in the context of Conduct Disorder. However, true Pyromania is rare (Schmitz, 2005), and will not be considered here.

Summary

There are a wide range of impulsive behaviours in which individuals engage that serve some affect regulatory function. Typically, research has indicated that there is an arousal pattern of stress or tension before engaging in an impulsive behaviour, coupled with feelings of failure to resist engaging in the behaviour; feelings of relief

or gratification during the impulsive behaviour; and a sense of relief, resolution and sometimes self-reproach or guilt after engaging in the behaviour (e.g., Blanco et al., 2008). Whether or not this pattern of arousal is the same for all impulsive behaviours is not known. It is certainly the case that an individual who engages in one form of impulsive behaviour is likely to engage in another. However, it is possible that rather than all serving the same affect regulatory purpose, individuals may engage in different behaviours in order to achieve different outcomes. For example, an individual may engage in binge eating as a self-soothing strategy, but engage in shoplifting in order to induce excitement. Research typically equates different impulsive behaviours with negative or positive emotions, yet the behaviour may elicit a neutral response. For some individuals, a desired outcome is to feel 'nothing' and engaging in impulsive behaviours may serve as a distraction from unwanted feelings and associated physical sensations whether these are positive or negative.

The role of impulsivity in BPD has been well established (Dougherty et al., 1999; Favazza & Simeon, 1995; Glenn & Klonsky, 2009) yet there has been little research attention given to the affect regulatory function of different impulsive behaviours for this group. Given that at least two impulsive behaviours are required to meet the diagnostic criteria for impulsivity in BPD (APA, 2000), it is important to establish what function different behaviours may serve. For example, for some individuals with BPD their impulsive behaviours may reflect a desire to reduce tension and self-soothe, whereas for others boredom or novelty-seeking may be at the core of their impulsivity. It also may be the case that individuals endorse both of these motivations depending on the selected behaviour. A closer investigation of these issues may help to improve the issue of heterogeneity of symptoms and

presentation in BPD. In addition, it also is possible that engaging in impulsive behaviours represents a different response in individuals with BPD in comparison to individuals without BPD. The current research seems to suggest that impulsive behaviours serve a similar function for all individuals, regardless of psychopathology.

Given that the research literature has emphasised the importance of the role of impulsivity both as a part of NSSI, and as a core symptom of BPD it needs to be established what specific role impulsivity plays in affect regulation. Similarly, if impulsive behaviours such as binge eating and substance use serve a similar affect regulation purpose to NSSI, then this would need to be considered in the assessment and treatment of these behaviours. Of course, in treatments which target NSSI through change in affect regulation (e.g., DBT) individuals are taught to control distress and regulate emotions with varying degrees of distress. These strategies have influence on a broad range of BPD symptoms (Linehan, 1993), though it has not yet been directly established that NSSI and other impulsive behaviours have the same underlying mechanisms. The following chapter aims to clarify the affect regulation function of different impulsive behaviours to see if it is similar or dissimilar to NSSI. It also will attempt to determine if this pattern of affect regulation is similar or dissimilar for those individuals with and without BPD.

CHAPTER 7

STUDY 2: A comparison of self-injury with other impulsive behaviours

INTRODUCTION

It has been suggested that NSSI can be conceptualised as an impulse control disorder due to the fact that it shares many commonalities with other impulsive behaviours (Favazza & Conterio, 1989; Pattison & Kahan, 1983). Recent research has found that many individuals who engage in NSSI will spend less than 5 minutes contemplating engaging in the behaviour (Nock & Prinstein, 2005). It also has been frequently reported that individuals who engage in NSSI are more likely to engage in other impulsive behaviours such as binge eating, alcohol and/or substance abuse, risky sexual behaviours, gambling, and shoplifting (Evans & Lacey, 1992; Herpertz et al., 1997; Zlotnick et al., 1996).

Individuals who engage in NSSI also are likely to report that they are impulsive, yet there have been discrepancies observed between self-report and performance based measures of impulsiveness in this regard (e.g., Janis & Nock, 2009). A study comparing individuals who repeatedly engaged in NSSI with 'first timers' found that those who repeated the behaviour were more impulsive than those with only a history of a single NSSI episode (Evans, Platts, & Liebenau, 1986). However, other studies have found that whereas impulsivity correlates with NSSI, it fails to distinguish those who engage in NSSI from controls who do not self-injure (e.g., Simeon et al., 1992), and that impulsivity only distinguishes female but not male self-injurers from controls (Hawton, Rodham, Evans, & Weatherall, 2002).

Some researchers have suggested that individuals who engage in NSSI may switch back and forth from NSSI to behaviours such as binge eating, substance use and risky sex (Selekman, 2009) when engaging in impulsive behaviours, due to the fact that the behaviours closely share the same affect regulatory functions (Miller,

2005). However, few studies actually have compared NSSI with other impulsive behaviours in order to determine if, in fact, the processes are the same. This will be the focus of the current investigation.

Most individuals who engage in NSSI experience difficulties with other forms of impulsivity (Lacey & Evans, 1986). For example, Favazza and Conterio (1989) noted in their study on NSSI, that about half of their sample either developed or had a history of eating disorders, and at least 20% had a history of alcohol and drug dependence and stealing (referred to as Kleptomania by the authors in the study). In another study of women with Alcohol Dependence, 25% had engaged in NSSI, 16% had an eating disorder, 50% described impulsive physical violence, and 50% reported engaging in risky sexual behaviour (Evans & Lacey, 1992). In another study investigating Bulimia Nervosa, 75% of individuals had engaged in NSSI, 78% had engaged in shoplifting, 34% met the diagnostic criteria for Alcohol Dependence, 22% met the diagnostic criteria for drug dependence and 53% reported sexual promiscuity (Fichter et al., 1994). It was not apparent in these studies whether or not these individuals met the diagnostic criteria for BPD.

In the DSM-IV-TR (APA, 2000) engaging in at least two impulsive behaviours satisfies criterion 4 for BPD, with the presence of NSSI satisfying criterion 5. However, it is not the case that all individuals who engage in NSSI and other impulsive behaviours such as binge eating or substance abuse would be diagnosed with BPD, or with any other psychiatric disorder for that matter (Stratton, 2006). The research literature clearly links impulsivity with a wide range of psychological problems, behavioural disturbances and criminality (Grant & Potenza, 2011; Moeller et al., 2001; Webster & Jackson, 1997). However, it also is the case

that not all individuals who engage in impulsive behaviours would meet the diagnostic criteria for a psychiatric condition. For example, binge eating is a common impulsive behaviour which does not necessarily accompany a diagnosis of an eating disorder (Fairburn & Wilson, 1996). Similarly, research has focused on a wide range of impulsive behaviours such as problematic mobile phone use (e.g., Billieux et al., 2008), and impulsive Internet use (Beard & Wolf, 2001; Grant & Potenza, 2011; van Rooij et al., 2010), which may occur in non-clinical populations.

Although it is unclear whether impulsiveness is a consequence or contributing factor to emotion dysregulation, different types of impulsive behaviours appear to be associated with different affect regulatory functions, at least in the non-borderline population. For example, binge eating has been demonstrated to function to reduce distress and bring about a sense of calm and well-being (Selby et al., 2008), but it is not known whether this function is in operation with individuals with BPD. Similarly, reckless sexual behaviour generally is considered to be consistent with novelty seeking (Gil, 2005) and to be a high risk and impulsive but pleasurable experience (Teese & Bradley, 2008), but research has produced little evidence as to whether individuals with BPD, in fact, do find these behaviours exciting. In addition, it generally is thought that gambling serves to increase psychophysiological arousal and feelings of excitement (Grant & Potenza, 2011), as does shoplifting (e.g., Goldman, 1991; Grant & Kim, 2002).

Although it may be speculated that the functions are the same for BPD and NBPD populations, this has not been established. With the difference in the psychophysiological response to NSSI determined between the BPD and NBPD groups, it would seem important to try and establish what specific psychological

factors may be associated with both NSSI and other impulsive behaviours. As mentioned previously, some researchers have suggested that chronic experiences of underarousal may contribute to the reason why individuals with BPD choose to engage in self-destructive behaviours such as NSSI (Herpertz et al., 1999). Underarousal is likely to increase impulsive behaviours due to a compensatory attempt to increase sensory stimulation (Eckhoff, Wong-Lin, & Holmes, 2009). Hence, it may be possible that some impulsive behaviours operate as a self-stimulating mechanism for individuals with BPD, in the same way that NSSI appears to do. If this relationship was to be demonstrated then it this information may be used to delineate specific treatment options for self-destructive behaviours, and identify if there is a need to consider BPD and NBPD individuals separately.

Previous research has identified that impulsiveness is most likely to manifest in situations where the individual experiences high arousal and, perhaps, negative affect (Glenn & Klonsky, 2010; Janis & Nock, 2009). Thus, impulsiveness is difficult to capture in a laboratory environment (Janis & Nock, 2009) due to the ethical considerations involved in inducing stress in research participants. However, as identified in Study 1, the use of guided imagery to assess the psychophysiological processes underlying a range of clinical behaviours has been validated across a broad range of empirical studies (e.g., Borkovec & Hu, 1990; Brain et al., 1998a, 1998b; Cook et al., 1988; Driscoll et al., 1997; Haines, Williams, Brain, & Wilson, 1995; Lang, 1979; Orr et al., 1993; Pitman et al., 1987; Watkins et al., 1990). In terms of impulsive behaviours, guided imagery has indeed been used successfully to examine the processes behind binge eating (Casey, Williams, & Haines, 2000; Williams et al., 1995). Further validation of this method with a range of other impulsive behaviours

could have important research outcomes for understanding the affect regulatory function of these behaviours. Similarly, it may provide valuable insight into the ways in which the psychophysiological processes underlying NSSI are similar or dissimilar to other impulsive behaviours, and what potential differences may exist between individuals with and without BPD.

In addition to an understanding of the psychophysiological processes behind impulsive behaviours, it also may be important to consider additional motivational aspects. There have been several theories to suggest what motivates individuals to engage in NSSI and other impulsive behaviours. These theories range from behavioural (e.g., positive and negative reinforcement, and self-stimulation hypotheses) to psychodynamic (e.g., anxiety and hostility reduction), and neurobiological (e.g., serotonergic, dopaminergic, and opioidergic hypotheses) (Winchel & Stanley, 1991). However, each of these theories, in some way, is concerned with the role that emotion may play in behaviour.

Research has indicated that when individuals are in a state of heightened emotional arousal, they are twice as likely to engage in high-risk behaviours (Huso, Shidlo, & Sandfort, 2011). In addition, if pleasure is experienced as a result of engaging in a particular behaviour, then the individual will pursue this experience again as a means of regulating affect, regardless of its level of riskiness or potential for self-destructiveness (Huso et al., 2011). Most theories of NSSI understand the motivation behind the behaviour as involving a process of negative reinforcement. That is, the behaviour is reinforced because it ends a negative emotional state (e.g., Glenn & Klonsky, 2010; Haines & Williams, 2003; Klonsky, 2007; Klonsky et al., 2003; Nock & Prinstein, 2004).

Specifically, one study indicated that those who engage in NSSI have difficulties with elevated levels of *urgency*, which indicates a tendency to quickly engage in maladaptive behaviours when negative affect is apparent (Glenn & Klonsky, 2010). Also in this study, individuals who engaged in NSSI could be differentiated from those who did not engage in the behaviour by demonstrating lower levels of premeditation (i.e., inability to delay action), and higher sensation seeking (i.e., tendency to seek excitement) in response to a computer-based behavioural measure of inhibitory control (i.e., a stop-signal task). This effect remained even when extraneous factors such as anxiety, depression and alcohol abuse were controlled for.

It is apparent that other impulsive behaviours, such as binge eating and substance use, may occur as a result of emotion dysregulation (Chapman et al., 2006, 2010; Glenn & Klonsky, 2010; Whiteside & Lynam, 2001), and that they all may share an emotion regulatory function. Other researchers also have associated negative affect with impulsive behaviours (Anestis et al., 2007; Brown, Lejuez et al., 2002). The role of emotional distress is important because it has the ability to alter the individual's priorities toward the immediate present. When people feel acutely bad, they often have an urgent need to feel better, and for some individuals this may mean engaging in maladaptive behaviours as a means of regulating affect (Tice et al., 2001). It also is of importance that self-control may often fail during emotional distress (O'Guinn & Faber, 1989; Peck, 1986), which, for some individuals, would lead to engaging in impulsive behaviours. For example, it is known that before engaging in behaviours such as gambling or shopping, individuals feel depressed, lonely or tense (Grant & Kim, 2002; McElroy et al., 1991). They then engage in

impulsive behaviours because they believe that it will make them feel better (Dickerson, 1991; Faber, 1992; Rook, 1987). Therefore, these individuals may give priority to the short-term goal of feeling better at the risk of long-term costs (Tice et al., 2001).

Whiteside and Lynam (2001) have proposed that there are four reasons why individuals engage in impulsive behaviours: sensation seeking, lack of premeditation, lack of perseverance, and urgency. Trait urgency has been found to be a factor associated with Bulimia (Claes et al., 2003), Alcohol Abuse (Whiteside & Lynam, 2003) and BPD (Whiteside et al., 2005). It would appear that urgency may contribute to individuals engaging in behavioural dysregulation. Individuals who exhibit high levels of urgency also are more likely to engage in other impulsive behaviours such as reckless driving (Nesbit et al., 2007) and dysregulated eating (Anestis et al., 2007) as a result of emotion dysregulation.

It is noteworthy that impulsiveness is the symptom of BPD that is reportedly the most likely to remit (Zanarini et al., 2004). Hence, if individuals have similar motivations for engaging in NSSI as they do for other impulsive behaviours then understanding the factors that lead to decreased behavioural impulsiveness may have important implications for the treatment of NSSI. Indeed, current treatments in this area are based on the premise that the reduction of dysregulated emotion will ultimately decrease the need for these maladaptive behaviours (Gratz, 2007). For example, if factors such as low self-control and low distress tolerance (e.g., from boredom) associated with NSSI are similar for other impulsive behaviours, then they can potentially be treated effectively with distress tolerance and emotion regulation components of Dialectical Behaviour Therapy (Linehan, 1993). However, if they are

dissimilar or they serve different functions, then it may be useful for clinicians to know that they should tailor DBT approaches according to whether an impulsive behaviour is associated with arousal increase or decrease.

Up to this point, the majority of the research literature primarily has concentrated on what could be described as internal motivations for engaging in impulsive behaviours. For example, motivations such as a desire for tension reduction or excitement are aimed at changing the individual's internal emotional and psychophysiological state. In contrast, external motivations may reflect a desire to engage in impulsive behaviours for operant reasons (i.e., to change someone else's behaviour). Although the role of operant motivations has received some research attention in the NSSI literature (e.g., Bostock & Williams, 1974; Henderson & Lance, 1979; O'Connor et al., 2000), there has been surprisingly little research in relation to other impulsive behaviours. Given the combination of affect regulation and interpersonal difficulties experienced by those individuals with BPD (APA, 2000), it could be suggested that engaging in impulsive behaviours could serve operant motivations (such as punishing others) for this group. Kreisman and Straus (2004) even argued that borderline impulsivity can be distinguished from impulsivity in other disorders in that the behaviours are usually reactions to disappointments from someone else. This would imply that the motivations behind impulsive behaviours sometimes are external.

For example, parasuicidal behaviours in BPD (such as impulsively taking an overdose of drugs or medication) often represent a desire to influence someone else's behaviour (Linehan, 1993). Similarly, impulsive damage to property is more likely to serve external motivations (Johnson et al., 2003). There also has been some

suggestion that shoplifting sometimes may be related to operant motivations associated with anger and a desire for revenge (Grant & Potenza, 2011; Shulman, 2003), however, this has not been researched extensively. This potentially under-researched area in the literature could explain why impulsivity in BPD is difficult to treat. That is, by relying on treatments for impulsive behaviours that only target internal motivations (which may be completely appropriate for individuals without BPD), clinicians may be overlooking the equally important role of external motivations.

Despite the prevalence of impulsive behaviours, in general, research has failed to pinpoint effective treatment (Moeller et al., 2001). If individuals with BPD have a fundamental difficulty with accurately labelling emotions and communicating motivations behind their self-destructive behaviours, then it may be difficult to apply components of therapies such as DBT that teach clients to identify all aspects of emotional response (subjective, physiological and behavioural). For example, clinicians inadvertently may be suggesting to BPD clients that they should feel calm or relaxed as a consequence of binge eating because this is what other individuals feel, and then offer acceptance skills and replacement strategies. Individuals with BPD, who cannot accurately determine what they feel, may agree with the suggestion that they feel calm but fail to benefit from this particular target for distress tolerance. In this way, clients with BPD who engage in impulsive behaviours potentially are not being treated effectively because they are responding to an inaccurate interpretation of how they are feeling.

The research evidence has suggested that emotional acceptance as part of affect regulation is an effective approach for the treatment of NSSI (e.g., Gratz,

2007). However, it is not known whether this also is true for the treatment of impulsive behaviours. Firstly, it needs to be established whether or not impulsive behaviours, in fact, do serve a similar affect regulation function as NSSI and share similar motivations to NSSI. Secondly, it has yet to be determined whether the affect regulatory function of different impulsive behaviours in similar or dissimilar in individuals with and without BPD. The research findings from Study 1 indicated that individuals with BPD have difficulties in accurately identifying emotions associated with NSSI. If this also is true for impulsive behaviours, then this may have important outcomes for assessment and treatment.

Summary

Although impulsivity is a heterogeneous construct (Glenn & Klonsky, 2010), generally it is believed that NSSI is an impulsive behaviour, and that individuals who engage in NSSI can be considered impulsive. This is due to the fact that they are likely to engage in other impulsive behaviours such as binge eating, shoplifting and substance use. Impulsivity and NSSI are two of the diagnostic criteria for BPD, yet it would be inaccurate to assume that all individuals who engage in self-damaging impulsive behaviours can be diagnosed with BPD. Despite this, the research has not thoroughly considered whether or not engaging in impulsive behaviours serves similar functions in those individuals with and without BPD. It would seem important to do so as it was apparent in Study 1 that NSSI actually serves a different affect regulatory function for people with and without BPD.

In the research literature on affect regulation and impulsive behaviours it has been identified that some behaviours (e.g., binge eating) may be associated with self-

soothing and tension reduction motivations (e.g., Garner & Garfinkel, 1997) whereas others (e.g., risky sexual behaviour) may be associated with sensation seeking and thrill-seeking motivations (Zuckerman, 2007). Again, the pleasurable effects associated with impulsive behaviours may not necessarily be consistent with the desire to self-soothe. Similarly, it may be the case that different stages of the impulsive behaviour (i.e., before, during, and afterwards) may be associated with different motivations and patterns of arousal. Identifying appropriate target goals for distress tolerance and emotion regulation skills training (e.g., frustration tolerance versus anxiety control) should then improve treatment outcomes for a range of individuals who engage in impulsive behaviours.

Aims and hypotheses

The aim of this study is to consider the function of the diagnostically relevant, impulsive behaviours of individuals with BPD to determine if this is similar to the function of NSSI for this group. A comparison will be made with a group without BPD to determine whether such impulsive behaviours are associated with different motivational factors in the absence of borderline psychopathology. It is expected that:

1. Engaging in impulsive behaviours will elicit an excitement response for those with BPD, as demonstrated by an increase in heart rate during the incident stage of the imagery script.
2. Impulsive behaviours will serve a tension reducing function for those individuals without BPD, as evidenced by a reduction in heart rate during the incident stage of the imagery script.

3. The response to the impulsive behaviours will mirror the arousal increase, excitement response to NSSI in the BPD group and will mirror the arousal decrease, calm response to NSSI in the NBPD group (as demonstrated in Study 1).
4. The groups' psychological responses to the imagery will also mirror the findings for NSSI in Study 1. The NBPD group will be able to accurately identify feelings of tension reduction associated with engaging in the impulsive behaviour (synchronous with psychophysiological responses)
5. Individuals with BPD will demonstrate a de-synchronous response to the imagery by reporting feelings of tension reduction when their psychophysiological responses to the impulsive behaviour demonstrate arousal increase.
6. In considering their psychological responses to impulsive behaviours before, during and after the behaviour, both groups will report higher ratings of sadness or distress before the behaviour, and tension reduction (as evidenced by higher ratings of happy/calm) during and after the behaviour.
7. Although both groups will have the option of reporting excitement as a response to impulsive behaviours before, during and after engaging in the behaviour it is anticipated that neither group will endorse this option.
8. The motivations for engaging in impulsive behaviours in the NBPD group will be associated with internal motivations (e.g., tension reduction and intropunitiveness) rather than external motivations.
9. Whereas the BPD group should report external motivations (e.g.,

extrapunitiveness) in response to impulsive behaviours due to their additional interpersonal difficulties.

METHOD

Participants

From the original sample of 60 participants from Study 1, a total of 42 individuals participated in the current study. There were 31 females and 11 males who were currently engaging in NSSI. The groups were separated into those individuals with BPD (n = 20) and those without BPD (n = 22). An attempt was made to invite all participants from Study 1 to participate in Study 2, however, only 42 could be contacted.

Apparatus and Materials

The same imagery scripts used in Study 1 were used in this study along with an additional imagery script of an impulsive behaviour that met the DSM-IV-TR (APA, 2000) Criterion 4 for BPD or was one of the impulsive behaviours listed in the DSM-IV-TR (APA, 2000) as Impulse-control Disorders Not Elsewhere Classified (APA, 2000). The apparatus used in Study 1 was used in the current study.

Psychological tests

A brief check list of impulsive behaviours was devised by the researcher to facilitate the selection of an appropriate target event, and to assess the frequency of the behaviour in addition to the number of years that individuals had been engaging in the behaviour (see Appendix E). Finally, participants were asked if they were

seeking professional help for the management of any of the behaviours (See Appendix E). The items selected for inclusion were taken from DSM-IV-TR (APA, 2000) criterion 4 for BPD, and some of the more common behaviours that would meet the diagnostic criteria for Impulse Control Disorders Not Elsewhere Classified. The list of items included gambling, excessive shopping or spending, binge eating, 'risky' sexual activities (e.g., unsafe sex, 'one night stands' or 'promiscuous' sex), substance use, reckless driving, stealing/shoplifting, and impulsive damage to property (e.g., setting fires, damaging or destroying one's own or someone else's property).

The Responses to Impulsive Behaviours Scale (RIBS) and the Motivations for Impulsive Behaviours Scale (MIBS) were administered to determine the motivation for engaging in the target behaviour and associated emotional responses before, during and after engaging in the behaviour (see Appendix E). These scales were devised by the researcher to measure psychological responses to a range of impulsive behaviours.

The MIBS is a modified version of the Motivations for Self-harm Scale (Brain, 1998) which was originally used to assess motivation for attempted suicide (see Henderson et al., 1977). This 45 item scale consisted of 8 subscales: *Depression*, *Extrapunitive* (hostility towards others), *Alienation* (feeling unwanted or extruded), *Operant* (used in attempt to alter the behaviour of others), *Modelling* (having recently been exposed to such behaviour by others), *Avoidance* (a temporary escape from an intolerable situation), *Tension Reduction* (seeking to relieve tension or anxiety), and *Janus Face* (ambivalent attitude towards life and death). An *Intropunitive* subscale was added by Brain (1998) to accommodate the reported self-

punishment motivation associated with suicidal behaviour (Brittlebank et al., 1990). This Intropunitive subscale was included in the MIBS in the current study.

The Motivation for Self-harm Scale has been used to examine the motivations of suicidal behaviour and in the development of typologies of suicidal behaviour (Brain, 1998; Haines, 1994; Henderson et al., 1977; Henderson & Lance, 1979). Items from each of the categories are scored on a 3 point scale: (1) Not at all; (2) A little; and (3) A great deal, according to the relevance of that item for the individual. Scores from each category range from 5 to 15. For the purposes of the present investigation, the item referring to pain ("Did it hurt as much as you thought it would?") was omitted.

In order to meet the criteria for impulsivity on the SCID-II (First et al., 1997) and the DSM-IV-TR (APA, 2000) definition of impulsivity for BPD (Criterion 4), the individual must demonstrate impulsivity in at least two areas (e.g., binge eating and shoplifting). To remain consistent with this definition, the MIBS required participants to complete the scale for two different impulsive behaviours. Therefore, the MIBS itself was presented twice, and participants could choose two behaviours from a list and complete the scale once for each of these two behaviours. Participants were advised that if they had only engaged in one behaviour, then they only needed to complete the scale once. Given that the research literature consistently has reported impulsivity among individuals who engage in NSSI (Evans & Lacey, 1992; Herpertz et al., 1997; Glenn & Klonsky, 2010; Zlotnick et al., 1996), it was thought that all participants would endorse at least one other impulsive behaviour. Despite this, it is certainly not the case that the DSM-IV-TR (APA, 2000) requires individuals to meet criterion 4 in order to receive a diagnosis of BPD.

The RIBS uses a Visual Analogue Scale presentation to assess participants' emotional responses to impulsive behaviours that they may have engaged in before, during and after engaging in the behaviour. Participants were asked to complete the items for all impulsive behaviours in which they had ever engaged, and ignore items in which they had never engaged. Again, the behaviours presented were NSSI, gambling, excessive shopping or spending, binge eating, risky sexual activity, substance use, reckless driving, stealing or shoplifting, and property damage. Items on the RIBS include the items: *I feel happy and calm*, *I feel happy and excited*, *I feel unhappy and sad*, and *I feel unhappy and distressed*. On each scale, participants place a vertical slash on the scale between the anchors of 'strongly agree' or 'strongly disagree'. Scores on the RIBS range from 0-100 with scores closest to 100 indicating a stronger level of agreement with the statement.

Procedure

The process of completing the interview and psychophysiological data session were the same as for Study 1. The questionnaires were provided to participants to complete outside of the interview.

RESULTS

Overview

Initially, descriptive information was analysed in order to determine any group differences in factors such as the mean age for each group, the range of impulsive behaviours in which participants engaged, the frequency of engaging in these behaviours, and additional factors such as help-seeking.

After analysing these descriptive factors, additional analyses were then performed in order to consider potential group differences in participants' motivations for engaging in impulsive behaviours. It was also considered important to try and establish whether or not these motivations for engaging in impulsive behaviours reflected a tension reduction or stimulatory function. After establishing which impulsive behaviours were engaged in most frequently by participants, and what may have been the primary motivation for these behaviours, participants' emotional responses were then considered. This was determined by presenting participants with a range of impulsive behaviours and asking them to rate how they felt before, during and after engaging impulsive behaviours. Emotional responses were grouped into the following categories: happy/calm, happy/excited, unhappy/sad and unhappy/distressed.

The second part of the results looked more specifically at participants' psychological and psychophysiological responses to a single impulsive event of their choosing. In order to examine these responses, the same guided imagery methodology outlined in Study 1 was utilised. In addition to the consideration of psychological and psychophysiological responses to impulsive behaviours it was hoped that these results could be compared with participants' responses to NSSI in order to determine any similarities or differences.

Description of sample

As for Study 1, consideration was given to demographic and NSSI related information. Participants' ages ranged from 18 to 47 years. For the BPD group the mean age was 21.8 years (*SD* = 5.9) and for the NBPD group, the mean age was 25.3

years (*SD* = 7.4). A comparison between groups with regard to demographic data is presented in Table 9. There were no significant differences between the groups on factors such as age, sex or education level.

Table 9

Sample characteristics of Borderline and non-Borderline individuals engaging in NSSI

Variable	**Level**		**Group** BPD	NBPD	**Analysis**
Sex	Female	%	90	68.2	χ^2 (1, N = 42) = 3.0, p>.05
Age		M	21.8	5.9	t(40) = 1.7, p>.05
		SD	25.3	7.4	
SCID-II score[a]		M	6.5	2.5	t(40) = 11.9, p<.0001
		SD	1.1	1.1	
Marital status	Single	%	70	63.6	χ^2(2, N = 42) = 1.9, p>.05
	Married		30	27.3	
	Sep/divorce		0	9.1	
Education level	University	%	80	63.6	χ^2(3, N = 42) = 2.4, p>.05
	Year 12		10	13.6	
	TAFE		0	9.1	
	Highschool		10	13.6	

[a] Structured Clinical Interview for DSM-IV-TR (APA, 2000) Axis II Disorders

It was also considered important to examine potential differences between BPD and NBPD individuals in terms of frequency and duration of NSSI, as well as factors such as previous suicide attempts and help-seeking behaviours. These results are presented in Table 10. Again, there were no significant differences between the two groups on any of these factors. Note, an analysis for hospital treatment could not

be performed as there were too few cases who endorsed this category (n = 12).

Table 10

Descriptive factors associated with NSSI for Borderline and Non-Borderline groups

Variable	Level		Group BPD	Group NBPD	Analysis
Freq. of NSSI	Daily	%	5.0	9.1	$\chi 2(4, N = 42) = 2.2, p>.05$
	Weekly		20.0	18.2	
	Fortnightly		10.0	13.6	
	Monthly		5.0	9.1	
	Yearly or <		55.0	36.4	
Dur. of NSSI	Years (%)	<1	10.5	14.3	$\chi^2(2, N = 40) = 0.4, p>.05$
		2-5	47.4	38.1	
		5>	42.1	47.61	
No. of injuries	<5	%	0.0	13.6	$\chi^2(3, N = 42) = 3.6, p>.05$
	<50		60.0	45.4	
	<100		20.0	27.3	
	>100		20.0	13.6	
Hospital[a]	Yes	%	45.0	18.2	$\chi^2(1, N = 42) = 3.5, p>.05$
Suicide att.[b]	Yes	%	70.0	54.6	$\chi^2(1, N = 42) = 1.1, p>.05$
Type suic. att	Overdose	%	84.6	81.8	$\chi^2(2, N = 42) = 1.4, p>.05$
	Cutting		15.4	9.1	
	Hanging		0.0	9.1	
Help seek SI[c]	Yes	%	50.0	40.9	$\chi^2(1, N = 42) = 0.3, p>.05$
Help seek any[d]	Yes	%	70.0	72.7	$\chi^2(1, N = 42) = 0.04, p>.05$
How long help[e]	Years (%)	<1	30.0	44.4	$\chi^2(1, N = 19) = 0.4, p>.05$
		>1	70.0	55.6	
Reason other help seek[f]	Axis I	%	71.4	100.0	$\chi^2(1, N = 13) = 20, p>.05$
	Axis II		28.6	0.0	

Current Ψ help?	Yes	%	65.0	36.4	$\chi^2(1, N = 42) = 3.4$ $p>.05$
Alc/drugs when NSSI[g]	Never/ rarely	%	50.0	54.6	$\chi^2(2, N = 42) = 2.1$, $p>.05$
	Sometimes		40.0	22.7	
	Always		10.0	22.7	

[a] Ever hospitalised for self-injury; [b] Ever attempted suicide; [c] Ever sought help for self-injury; [d] Ever sought help for any reason; [e] How long until sought help for NSSI; [f] Reasons for seeking help if not for NSSI; [g] When engaging in NSSI do you use alcohol or drugs at the time?

Suicidal intent

The mean ISS score for the BPD group was 6.4 (*SD* = 2.6) and, for the NBPD group, the mean score was 4.7 (*SD* = 2.0), both of which are at the lower end of the *medium* range for suicidal intent (Pierce, 1977). As for Study 1, unpaired t-tests indicated that these scores were significantly different, $t(40) = 2.3$, $p<.03$, however, the chi square results for the categories of suicidal intent (low, medium, high) were not, $\chi^2(2, N = 42) = 1.7$, $p>.05$. For the category of low suicidal intent, 20% of individuals with BPD, and 26.2% of individuals without BPD fell into this category. For the medium category, 75% of individuals with BPD and 68.2% of individuals without BPD had scores that fell within this range. Finally, there were 5% of individuals with BPD whose scores fell in the high range of suicidal intent, whereas none of the individuals in the NBPD group had scores that fell in the category of high suicidal intent.

Impulsive behaviours

Range of impulsive behaviours and differences between BPD and NBPD groups

The Impulsive Behaviours Checklist asked participants about the following: (a) whether the individual had ever engaged in the behaviour; (b) whether or not the

behaviour was current (i.e., the participant had engaged in the behaviour in the last 12 months); (c) the frequency of engaging in the behaviour (e.g., daily, fortnightly, weekly, monthly or yearly), (d) the total number of times the individual engaged in the behaviour (e), the duration (years) of engaging in the behaviour, and (f) whether or not the individual ever sought psychological assistance for this behaviour. These results are presented in Table 11.

As demonstrated in the table below, the only significant findings for group differences were for binge eating and impulsive property damage. For the BPD group, a greater number of individuals than expected had ever engaged in binge eating: $\chi^2(1, N = 42) = 7.8$, $p = .006$. Similarly, a greater number than expected of BPD individuals were currently engaging in binge eating: $\chi^2(1, N = 39) = 8.9$, $p = .003$. For impulsive damage to property, a greater number than expected of individuals with BPD were currently engaging in the behaviour: $\chi^2(1, N = 39) = 4.7$, $p = .04$.

Table 11

Descriptive factors associated with impulsive behaviours for Borderline and Non-Borderline groups

Variable	Level		Group BPD	Group NBPD	Analysis
Gambling	Ever?	%	40.0	36.4	$\chi^2(1, N = 42) = .1, p>.05$
	Current?	%	30.0	27.3	$\chi^2(1, N = 42) = .04, p>.05$
Freq. of gambl.	Daily	%	0.0	12.5	$\chi^2(4, N = 42) = 4.15, p>.05$
	Weekly		26.8	0.0	
	Fortnightly		0.0	12.5	
	Monthly		28.6	37.5	
	Yearly or <		42.9	37.5	
Total no. gambl	<5	%	14.3	37.5	$\chi^2(2, N = 15) = 1.05, p>.05$
	<50		71.4	50.0	
	<100		14.3	12.5	
	>100		0.0	0.0	
Dur. of gambl.	Years	<1	14.3	0.0	$\chi^2(2, N = 14) = 1.1, p>.05$
		2-5	42.9	42.9	
		5>	42.9	57.1	
Help seek gamb.	Yes	%	0.0	0.0	
Excess spend	Ever?	%	80.0	52.4	$\chi^2(1, N = 41) = 3.5., p>.05$
	Current?	%	100.0	100.0	
Freq. of spend	Daily	%	0.0	0.0	$\chi^2(3, N = 27) = 2.1, p>.05$
	Weekly		18.7	18.2	
	Fortnightly		25.0	9.1	
	Monthly		50.0	72.7	
	Yearly or <		62.0	0.0	
Total no. spend	<5	%	0.0	16.7	$\chi^2(2, N = 28) = 3.02, p>.05$
	<50		62.5	58.3	
	<100		37.5	25	
	>100		0.0	0.0	
Dur. of spend	Years	<1	6.2	9.1	$\chi^2(2, N = 27) = 0.5, p>.05$
		2-5	50.0	36.4	
		5>	43.7	54.6	

Help seek spend	Yes	%	10.5	0.0	$\chi^2(1, N = 39) = 2.2, p>.05$
Binge eating	Ever?	%	90.0	50.0	$\chi^2(1, N = 42) = 7.8, p = .006$*
	Current?	%	88.9	42.9	$\chi^2(1, N = 39) = 8.9, p = .003$*
Freq. of binge	Daily	%	11.1	18.2	$\chi^2(4, N = 29) = 2.2, p>.05$
	Weekly		61.1	54.6	
	Fortnightly		5.6	18.2	
	Monthly		16.7	9.1	
	Yearly or <		5.6	0.0	
Total no. binge	<5	%	5.6	0.0	$\chi^2(2, N = 29) = 1.6, p>.05$
	<50		33.3	18.2	
	<100		61.6	81.8	
	>100		0.0	0.0	
Dur. of binge	Years	<1	11.1	0.0	$\chi^2(2, N = 29) = 1.8, p>.05$
		2-5	44.4	36.4	
		5>	44.4	63.4	
Help seek binge	Yes	%	30.0	18.2	$\chi^2(1, N = 42) = .8, p>.05$
Risky sex	Ever?	%	45.0	54.5	$\chi^2(1, N = 42) = .4, p>.05$
	Current?	%	40.0	38.1	$\chi^2(1, N = 41) = .02, p>.05$
Freq. of risk sex	Daily	%	10.0	0.0	$\chi^2(4, N = 22) = .5.5, p>.05$
	Weekly		20.0	8.3	
	Fortnightly		10.0	0.0	
	Monthly		60.0	66.7	
	Yearly or <		0.0	25.0	
Total no. risk sex	<5	%	10.0	25.0	$\chi^2(2, N = 22) = 1.1, p>.05$
	<50		60.0	58.3	
	<100		30.0	16.7	
	>100		0.0	0.0	
Dur. of risk sex	Years	<1	20.0	16.7	$\chi^2(2, N = 22) = .9, p>.05$
		2-5	50.0	33.3	
		5>	30.0	50.0	
Help seek risk sex	Yes	%	11.1	0.0	$\chi^2(1, N = 39) = 2.5, p>.05$
Substance use	Ever?	%	70.0	72.7	$\chi^2(1, N = 42) = .04, p>.05$
	Current?	%	65.0	59.1	$\chi^2(1, N = 22) = .2, p>.05$
Freq. of SU	Daily	%	0.0	0.0	$\chi^2(4, N = 32) = 1.6, p>.05$
	Weekly		33.3	33.3	
	Fortnightly		26.7	6.7	
	Monthly		35.7	21.4	
	Yearly or <		21.4	21.4	

Total no. SU	<5	%	0.0	6.2	$\chi^2(2, N = 30) = 1.2, p>.05$
	<50		28.6	18.7	
	<100		71.4	75.0	
	>100		0.0	0.0	
Dur. of SU	Years	<1	14.3	0.0	$\chi^2(2, N = 30) = 2.9, p>.05$
		2-5	42.9	37.5	
		5>	42.9	62.5	
Help seek SU	Yes	%	38.9	22.7	$\chi^2(1, N = 40) = 1.2, p>.05$
Reckless driving	Ever?	%	35.0	31.8	$\chi^2(1, N = 42) = .05, p>.05$
	Current?	%	35.3	15.0	$\chi^2(1, N = 37) = 2.1, p>.05$
Freq. of reck dr.	Daily	%	28.6	0.0	$\chi^2(4, N = 14) = 15.2, p>.05$
	Weekly		28.6	28.6	
	Fortnightly		14.3	0.0	
	Monthly		28.6	42.9	
	Yearly or <		0.0	28.6	
Total no. reck dr.	<5	%	14.3	28.6	$\chi^2(2, N = 14) = 1.5, p>.05$
	<50		42.9	57.1	
	<100		14.9	14.3	
	>100		0.0	0.0	
Dur. of reck dr.	Years	<1	28.6	28.6	$\chi^2(2, N = 14) = .5, p>.05$
		2-5	42.9	57.1	
		5>	28.6	14.3	
Help seek reck drive	Yes	%	0.0	5.0	$\chi^2(1, N = 37) = .9, p>.05$
Stealing	Ever?	%	36.8	23.8	$\chi^2(1, N = 40) =. 8, p>.05$
	Current?	%	21.0	5.3	$\chi^2(1, N = 38) = 2.1, p>.05$
Freq. of stealing	Daily	%	0.0	0.0	$\chi^2(3, N = 12) = 4.5, p>.05$
	Weekly		14.3	40.0	
	Fortnightly		14.3	20.0	
	Monthly		57.1	0.0	
	Yearly or <		14.3	40.0	
Total no. steal	<5	%	16.7	0.0	$\chi^2(2, N = 11) = 1.4, p>.05$
	<50		66.7	60.0	
	<100		16.7	40.0	
	>100		0.0	0.0	
Dur. of steal	Years	<1	28.6	20.0	$\chi^2(2, N = 12) = .3, p>.05$
		2-5	42.9	60.0	
		5>	28.6	20.0	

Help seek steal	Yes	%	0.0	0.0	N/A
Property damage	Ever?	%	31.6	15.0	$\chi^2(1, N = 39) = 1.5, p>.05$
	Current?	%	31.6	5.0	$\chi^2(1, N = 39) = 4.7, p = .04$*
Freq. of damage	Daily	%	0.0	0.0	$\chi^2(2, N = 9) = 2.4, p>.05$
	Weekly		0.0	0.0	
	Fortnightly		16.7	0.0	
	Monthly		66.7	33.3	
	Yearly or <		16.7	66.7	
Total damage	<5	%	33.3	100.0	$\chi^2(2, N = 9) = 3.6, p>.05$
	<50		33.3	0.0	
	<100		33.3	0.0	
	>100		0.0	0.0	
Dur. of damage	Years	<1	33.3	66.7	$\chi^2(2, N = 9) = 2.2, p>.05$
		2-5	50.0	0.0	
		5>	16.7	33.3	
Help seek damage	Yes	%	5.9	0.0	$\chi^2(1, N = 37) = 1.2, p>.05$

* indicates significant result

Motivations for impulsive behaviours

Examination was made of differences in motivation for impulsive behaviours for the two groups. Participants were asked to complete the scale twice, each time considering a different impulsive behaviour. This was to facilitate with a more accurate comparison of criterion 4 of the DSM-IV-TR (APA, 2000) definition of impulsivity for BPD and NBPD groups. In order to meet the classification for criterion 4 of BPD, an individual must have engaged in at least two behaviours that are potentially self-damaging. Participants were able to choose from the list of 8 behaviours previously identified to consider when completing the scale.

All participants indicated that they had engaged in at least one impulsive behaviour. Of the total sample, 88.1% of participants indicated that they had engaged in at least two impulsive behaviours.

When considering an impulsive behaviour that they had engaged in to apply to the MIBS-I, 4.8 % of participants chose gambling, 7.1% chose excessive spending, 40.5% chose binge eating, 7.1% chose risky sexual behaviour, 35.7% chose substance use, 4.8% chose reckless driving, and no participants selected stealing or shoplifting or property damage to endorse. As previously stated, there is inconsistency in the research literature in regards to whether the affect regulatory function of impulsive behaviour is to reduce tension or to provide stimulation.

There were no significant differences between the BPD and NBPD groups on ratings on the MIBS-I (see Appendix E). However, there was a main effect for the motivation *Depression*, $t(40) = .1$, $p<.05$. The MIBS-I related to the impulsive behaviour that was most frequently engaged in by participants. In this case,
It could be identified that the most problematic impulsive behaviour was binge eating. *Depression* as the primary motivation for this behaviour perhaps then indicates that binge eating served a tension reduction rather than a stimulatory response for participants.

For the MIBS-II, participants selected a second impulsive behaviour to consider when completing the scale, and this represented the second most problematic impulsive behaviour for the sample. On the MIBS-II, 5.4% of participants chose gambling, 16.1% chose excessive spending, 21.6% chose binge eating, 16.2% chose risky sexual behaviour, 27.0% chose substance use, 8.1% chose reckless driving, 2.7% chose stealing or shoplifting and 2.7% chose property damage. Similar to the MIBS-I, there were no significant group differences for the MIBS-II (see Appendix E). There was again, however, a main effect for the motivation of *Depression* $t(40) = 0.6$, $p<.05$. This finding also seems to indicate that

engaging in substance use may have served a tension reduction, rather than a stimulatory function for participants.

An examination of the differences across the motivations was then considered. This was in order to determine which motivations were most influential. Means, standard deviations and results for least significant differences are presented in Table 12.

Table 12

Results for differences across the Motivations for Impulsive Behaviours (MIBS)

Motivation	**MIBS-I**		**MIBS-II**		**Differences**
	M	**SD**	**M**	**SD**	
Depression	10.3	3.4	8.9	3.5	Depress. > Extrapun. Depress.>Operant Depress.>Modelling Depress.>Tension R. Depress.>Janus Face
Extrapunitive	7.6	3.0	8.3	3.6	Extrapun.<Alienation Extrapun.<Modelling Extrapun.<Avoidance Extrapun. <Intropun.
Alienation	9.6	3.2	9.1	3.5	Alienation>Operant Alienation>Tension R. Alienation>Janus Face
Operant	7.0	2.7	7.6	3.3	Operant<Modelling Operant<Avoidance Operant<Tension R. Operant<Janus Face Operant<Intropun.
Modelling	8.7	2.2	8.5	2.5	Modelling<Avoidance
Avoidance	9.9	3.9	8.5	3.1	Avoidance>Tension R. Avoidance>Janus Face
Tension Red.	8.4	2.4	8.0	2.5	Tension R. <Intropun.
Janus Face	8.5	3.4	7.7	2.8	N/A
Intropunitive	9.5	3.5	9	3.7	N/A

For the MIBS-I, there was a significant main effect $F(8,328) = 8.8$, $MSE = 51.2$, $p = .0001$, Fisher's LSD = 1.0. There were significant differences for the motivation of *Depression*, whereby depression was considered a more strongly

motivating factor than *Extrapunitive*, *Operant*, *Modelling*, *Tension Reduction* and *Janus Face* motivations. For *Extrapunitiveness*, this motivation was significantly lower than *Intropunitive*, *Avoidance*, *Modelling* and *Alienation* motivations. *Alienation* was greater than *Operant*, *Tension Reduction* and *Janus Face* motivations. *Operant* motivations were rated lower than *Modelling*, *Avoidance*, *Tension Reduction*, *Janus Face* and *Intropunitive* motivations. For *Modelling*, this motivation was rated lower than *Avoidance*. For *Avoidance*, this motivation was rated as greater than *Janus Face* and *Tension Reduction*. Finally, *Tension Reduction* was rated as lower than *Intropunitive* motivations. For the MIBS-II, there were no significant differences between the different motivations (see Appendix E). An examination of motivations more specific to NSSI (using the original MFSH scale, on which the MIBS is based), will be considered in Study 3.

Responses to impulsive behaviours

Participants were then asked to rate their responses to any impulsive behaviours that they had engaged in (including NSSI), thinking about how they felt before, during and immediately after that behaviour (see Table 13). This approach utilised the same VAS presentation as that used for psychological responses to guided imagery in each of the three studies.

Table 13

Means and standard deviations for each group on RIBS for the NSSI script

Group Responses	***Before***		***During***		***After***	
	M	**SD**	**M**	**SD**	**M**	**SD**
Happy/Calm						
BPD	5.7	6.8	37.3	29.9	56.5	38.4
NBPD	7.4	12.4	31.2	30.0	48.8	40.5
Happy/Excitement						
BPD	13.7	22.3	35.7	29.8	40.2	33.3
NBPD	7.3	13.1	19.1	26.8	21.7	32.2
Unhappy/Sad						
BPD	75.8	33.8	48.1	34.8	43.1	35.2
NBPD	89.0	15.3	53.5	32.9	42.2	34.6
Unhappy/Distressed						
BPD	82.8	33.3	40.7	35.4	39.0	33.9
NBPD	88.3	18.4	51.3	37.4	42.4	33.8

There was no significant group interaction between BPD and NBPD groups for their responses to impulsive behaviours. However, there were significant main effects for the NSSI script. These results are summarised below in Table 14.

Table 14

The post hoc analysis results for the Responses to Impulsive Behaviours Scale for NSSI

Responses	**df**	***F***	***MSE***	***p***	**Fisher's LSD**	**Differences**
Happy/Calm	2,78	40.2	22008.5	.0001	10.2	B<D,A D<A
Happy/ Excited	2,80	11.4	4995.9	.0001	9.1	B<D,A
Unhappy/Sad	2,78	31.2	17974.7	.0001	10.5	B>D,A
Unhappy/Distressed	2,80	46.8	25165.5	.0001	10.0	B>D,A

Note: B = Before, D = During, A = After

As there were no significant differences between the BPD and NBPD groups for their responses to impulsive behaviours, scores for the RIBS were then combined and analysed. The following results compare NSSI with the mean of all other impulsive behaviours, so that all participants were included in the analysis. The impulsive behaviour *damage to property* was not included in the analysis as too few participants engaged in this behaviour. Similarly, a comparison of NSSI with each emotion on the RIBS (happy/calm, happy/excited, unhappy/sad, and unhappy/distressed) with each impulsive behaviour not possible as some behaviours had too few cases with which to make such a comparison.

Firstly, for *NSSI* there was no reaction for stage (i.e., before, during, after) by group, but there was a significant main effect $F(6, 234) = 38.9$, $MSE = 22520.7$, $p<.0001$. For *gambling*, there was no significant reaction for stage by group, but there was a significant main effect $F(6,66) = 6.2$, $MSE = 1423.2$, $p<.0001$. For

excessive spending there was no significant reaction for stage by group, but there was a significant main effect, $F(6, 138) = 4.1$, $MSE = 2435.6$, $p = .0007$. For binge eating, there was no significant reaction for stage by group, but there was a significant main effect $F(16, 162) = 8.4$, $MSE = 7812.9$, $p<.0001$.

For *risky sex* there was a significant reaction for stage by group $F(6, 120) = 2.2$, $MSE = 714.6$, $p<.05$. Independent groups *t*-tests were performed to examine group differences at each stage (see Appendix E). The only significant result was for excitement, whereby the BPD group were more excited *before* engaging in risky sex than the NBPD group $t(20) = 2.4$, $p<.03$.

Next, differences in reactions to each stage for each group were analysed. These differences are presented in Table 15.

Table 15

Reactions differences to each stage of the RIBS scale for each group for risky sex

Stage	Group	df	*F*	*MSE*	*p*	Fisher's LSD	Differences
Before	BPD	3, 27	8.7	4714.2	.0003	21.3	Ex>C,S,D C>D
	NBPD	3, 33	2.2	1262.4	ns		
During	BPD	3, 27	9.0	7270.8	.0003	26.1	Ex>C,S,D C>S,D
	NBPD	3, 33	1.0	822.0	ns		
After	BPD	3, 27	0.1	128.1	ns		
	NBPD	3, 33	0.1	15.4	ns		

Note: Ex = Excited, C = Calm, S = Sad, D = Distressed

Across stage changes were then analysed to examine changes in reaction for each group. For the impulsive behaviour risky sex, participants with BPD were significantly more excited before and during the behaviour than they were afterwards. The participants with BPD were also less sad and less distressed before and during risky sex than they were afterwards. For the NBPD participants, they were less distressed before engaging in risky sex then they were afterwards.

Table 16

Across stage changes for each reaction for each group on the RIBS for risky sex

Reaction	Group	df	*F*	*MSE*	*p*	Fisher's LSD	Differences
Calm	BPD	3, 27	0.1	44.4	ns		
	NBPD	3, 33	1.0	335.2	ns		
Excited	BPD	3, 27	5.6	2805.6	0.2	21.1	B,D>A
	NBPD	3, 33	0.5	110.8	ns		
Sad	BPD	3, 27	8.7	3321.1	.003	18.4	B,D<A
	NBPD	3, 33	3.3	771.5	ns		
Distressed	BPD		7.4	3094.0	.005	19.3	B,D<A
	NBPD		4.8	1139.1	.02	13.0	B<A

Note: B = Before, D= During, A = After

For *substance use,* there was no significant reaction by stage by group, but there was a significant main effect $F(6, 162) = 15.4$, $MSE = 13595.0$, $p<.0001$. For *reckless driving* there was no reaction by stage by group, but there was a significant main effect $F(6,60) = 3.0$, $MSE = 1895.7$, $p<.02$. For *stealing*, there was no significant reaction by stage by group, or a significant reaction by stage, but there was a significant main effect $F(3, 36) = 10.2$, $MSE = 16102.8$, $p<.0001$. Post hoc results for the main effect were 18.6 (Fisher's LSD), where excited was greater than calm, sad and distressed.

Post hoc analyses showing differences at each stage of the impulsive behaviour for NSSI, gambling, spending, binge eating, substance use, and reckless driving are presented in Table 17.

Table 17

The post hoc analysis results for differences at each stage for RIBS items for BPD and NBPD groups

Behaviour	Stage	df	*F*	*MSE*	*p*	Fisher's LSD	Differences
NSSI	Before	3, 120	185.8	782650.0	.0001	9.0	C<S,D Ex<S,D
	During	3, 120	4.3	47202.2	.0007	14.5	S>C,Ex D>Ex
	After	3, 120	2.5	34670.0	ns		
Gamble	Before	3, 36	63.5	16634.7	.0001	12.7	C,Ex>S,D
	During	3, 36	54.7	16199.6	.0001	13.7	C,Ex.>S,D
	After	3, 36	11.4	4676.8	.0001	16.1	C,Ex.>S,D
Spending	Before	3, 72	3.2	2483.0	.03	15.7	D<C,Ex S<Ex
	During	3, 72	28.9	14736.7	.0001	12.7	Ex>C,S,D C>S,D
	After	3, 72	0.7	682.4	ns		
Binge	Before	3, 84	15.2	19324.0	.0001	18.6	C>Ex,S,D
	During	3, 84	2.8	2724.1	.05	16.1	C>Ex,S,D
	After	3, 84	4.0	5369.7	.02	19.1	Ex<C,S,D
Substance	Before	3, 84	2.6	3843.5	ns		
	During	3, 84	29.8	24044.3	.0001	14.8	C,Ex>S,D
	After	3, 84	12.3	121370.0	.0001	16.4	C>Ex,S,D Ex>S,D
Drive	Before	3, 33	16.4	8631.1	.0001	19.1	C,Ex<S,D
	During	3, 33	0.7	835.9	ns		
	After	3, 33	.03	47.21	ns		

Note: stealing and risky sex were not significant so are not included here

C = Calm, Ex = Excited, S = Sad, D = Distressed

Next, across stage changes were analysed for each emotional response (i.e., I feel happy and calm, I feel happy and excited, I feel unhappy and sad, and I feel unhappy and distressed) to determine if each emotion was associated with increase or decrease before, during and after engaging in the behaviour. These results are presented in Table 18

Table 18

The post hoc analysis results for across changes for each RIBS for the BPD and NBPD groups for RIBS items

Response to Behaviour	**df**	***F***	***MSE***	***p***	**Fisher's LSD**	**Differences**
NSSI						
Calm	2, 80	40.4	21787.5	.0001	10.2	B<D,A D<A
Excited	2, 82	11.1	4865.7	.0001	9.1	B< D,A
Sad	2, 80	32.3	18503.0	.0001	10.5	B>D,A
Distressed	2, 82	47.7	25201.1	.0001	10.0	B>D,A
Gamble						
Calm	2, 24	0.9	232.5	ns		
Excited	2, 26	9.9	1968.0	.0006	10.9	A<B,D
Sad	2, 24	6.6	1284.7	.006	11.3	A>B,D
Distressed	2, 26	3.6	598.0	.05	10.0	A>B,D
Spending						
Calm	2, 48	0.7	386.2	ns		
Excited	2, 48	4.4	2676.4	.02	14.0	D>B,A
Sad	2, 48	4.1	1835.2	.03	12.0	D<B,A
Distressed	2, 48	7.4	3402.2	.002	12.19	B<A

Binge						
Calm	2, 56	7.9	7427.2	.0009	16.4	B<A
Excited	2, 58	6.8	3391.2	.003	11.5	B<D,A
Sad	2, 56	9.0	8093.1	.0004	13.8	B>D,A
Distressed	2, 58	7.3	6661.9	.002	15.6	B>D,A
Substance						
Calm	2, 56	14.6	12311.8	.0001	15.3	B<D,A
Excited	2, 56	9.4	669.9	.0003	14.0	D>B,A
Sad	2, 56	13.0	9605.4	.0001	14.3	B>D,A
Distressed	2, 56	18.3	13789.7	.0001	14.4	B>D,A
Drive						
Calm	2, 22	1.2	600.2	ns		
Excited	2, 22	1.0	762.2	ns		
Sad	2, 22	7.0	3356.5	.005	18.6	B>D,A
Distressed	2, 22	6.3	4129.5	.007	21.7	B>D,A

Note: results for risky sex and stealing were not significant so are not included here
B = before, D = during, A = After

Finally, group scores were combined and NSSI was compared with the mean of all other impulsive behaviours. Means and standard deviations are presented in Appendix E. For NSSI by gambling, there were significant behaviour by stage results for *Calm* $F(2, 22) = 9.3$, $MSE = 3264.3$, $p<.05$, and *excited* $F(2, 22) = 16.8$, $MSE = 6025.4$, $p<.0001$. Results for *sad* and *distressed* were non significant.

For NSSI by spending, there were significant behaviour by stage results for *calm* $F(2, 46) = 18.7$, MSE = 10828.1, $p<.0001$, *excited* $F(2, 46) = 19.9$, MSE =

10081.7, $p<.0001$, *sad* $F(2, 46) = 22.2$, $MSE = 9602.0$, $p<.0001$ and *distressed* $F(2, 46) = 16.9$, $MSE = 7685.5$, $p<.0001$.

For NSSI by binge eating there were significant behaviour by stage results for *calm* $F(2, 54) = 11.1$, $MSE = 5017.0$, $p<.0001$, *excited* $F(2, 54) = 27.3$, $MSE = 9220.7$, $p<.0001$, *sad* $F(2, 54) = 18.9$, $MSE = 19520.7$, $p<.0001$, and *distressed* $F(2, 54) = 17.2$, $MSE = 18548.3$, $p<.0001$.

For NSSI by risky sex there were significant behaviour by stage results for calm $F(2, 40) = 18.0$, $MSE = 5774.7$, $p<.0001$, *excited* $F(2, 40) = 27.2$, $MSE = 12860.4$, $p<.0001$, *sad* $F(2, 40) = 9.5$, $MSE = 3623.8$, $p<.0004$, and *distressed* $F(2, 40) = 6.7$, $MSE = 2751.1$, $p<.004$.

For NSSI by substance use there were significant results for behaviour by stage for *calm*, $F(2,54) = 9.1$, $MSE = 4657.4$, $p<.0004$, *excited*, $F(2,54) = 8.3$, $MSE = 3946.8$, $p<.0007$, and *sad*, $F(2,54) = 6.0$, $MSE = 1198.4$, $p<.0005$. There was a significant main effect for *distressed,* $F(1,27) = 22.6$, $MSE = 19814.3$, $p<.0001$, where the NSSI was associated with higher levels of distress than the Impulsive script.

For NSSI by stealing, there were significant behaviour by stage effects for *calm*, $F(2,24) = 4.5$, $MSE = 2008.8$, $p<.03$, *sad*, $F(2,24) = 6.4$, $MSE = 3159.0$, $p<.006$, and *distressed* $F(2,24) = 11.1$ $MSE = 5246.1$ $p<.0004$. There was a main effect for *excited*, $F(1,12) = 44.1$, $MSE = 29881.0$ $p<.0001$, where the Impulsive script was associated with more excitement than the NSSI script. It was not possible to compare NSSI to reckless driving as too few individuals engaged in this behaviour.

Paired *t*-tests were then performed to examine differences at each stage.

These results are presented in Table 19.

Table 19

Differences at each stage of each reaction for NSSI by each impulsive behaviour

Response to Behaviour	**Stage**	**df**	***t***	***p***	**Differences**
Gambling (n = 13)					
Calm	Before	12	12.5	<.0001	IMP>NSSI
	During	12	5.5	<.0001	IMP>NSSI
	After	12	2.0	ns	
Excited	Before	12	13.7	<.0001	IMP>NSSI
	During	12	7.0	<.0001	IMP>NSSI
	After	12	0.9	ns	
Spending (n = 25)					
Calm	Before	24	7.4	<.0001	IMP>NSSI
	During	24	2.3	<.04	IMP>NSSI
	After	24	1.5	ns	
Excited	Before	24	7.0	<.0001	IMP>NSSI
	During	24	3.8	<.001	IMP>NSSI
	After	24	0.9	ns	
Sad	Before	24	5.6	<.0001	IMP>NSSI
	During	24	1.5	ns	
	After	24	2.1	<.05	NSSI>IMP
Distressed	Before	24	4.9	<.0001	IMP>NSSI
	During	24	2.2	<.05	NSSI>IMP
	After	24	1.7	ns	

Binge (n = 29)					
Calm	Before	28	3.5	<.002	IMP>NSSI
	During	28	3.4	<.002	IMP>NSSI
	After	28	1.4	ns	
Excited	Before	28	3.1	<.005	IMP>NSSI
	During	28	1.1	ns	
	After	28	3.1	<.005	NSSI>IMP
Sad	Before	28	9.8	<.001	IMP>NSSI
	During	28	0.8	ns	
	After	28	0.1	ns	
Distressed	Before	28	9.2	<.0001	IMP>NSSI
	During	28	0.6	ns	
	After	28	0.3	ns	
Risky sex (n = 22)					
Calm	Before	21	7.1	<.0001	IMP>NSSI
	During	21	1.3	ns	
	After	21	0.8	ns	
Excited	Before	21	9.8	<.0001	IMP>NSSI
	During	21	3.6	<.002	IMP>NSSI
	After	21	0.8	ns	
Sad	Before	21	4.9	<.0001	IMP>NSSI
	During	21	0.4	ns	
	After	21	0.5	ns	
Distressed	Before	21	3.9	<.0008	IMP>NSSI
	During	21	0.3	ns	
	After	21	0.5	ns	
Substance (n = 29)					
Calm	Before	28	4.7	<.0001	IMP>NSSI
	During	28	4.7	<.0001	IMP>NSSI
	After	28	0.04	ns	
Excited	Before	28	4.0	<.0001	IMP>NSSI
	During	28	5.2	<.0001	IMP>NSSI
	After	28	1.2	ns	
Sad	Before	28	4.3	<.0002	NSSI>IMP
	During	28	5.0	<.0001	NSSI>IMP
	After	28	1.8	ns	

Stealing (n = 14)					
Calm	Before	13	2.5	<.03	IMP>NSSI
	During	13	1.3	ns	
	After	13	0.9	ns	
Sad	Before	13	5.0	<.0002	NSSI>IMP
	During	13	4.0	<.002	NSSI>IMP
	After	13	1.3	ns	
Distressed	Before	13	5.0	<.0003	NSSI>IMP
	During	13	1.2	ns	
	After	13	0.4	ns	

Notes: reckless driving was not included as too few individuals endorsed this behaviour.
Non-significant results for sad, distressed and excited are not included here
IMP = impulsive script, N = Neutral script, AI = Accidental Injury script, NSSI = Nonsuicidal self-injury script

Examination of the processes underlying impulsive behaviours

After examining the participants' motivations for engaging in impulsive behaviours, it was considered important to investigate the underlying psychological and psychophysiological processes associated with these behaviours. In order to address this, the same guided imagery methodology used in Study 1 to examine NSSI was applied to the consideration of other impulsive behaviours.

Firstly, participants were asked to select an impulsive behaviour that would satisfy the DSM-IV-TR (APA, 2000) criteria. The impulsive behaviour that participants chose would then be used as the target behaviour for the guided imagery script. Participants' psychological and psychophysiological responses specific this impulsive behaviour were then measured. Figure 8 presents the range of impulsive behaviours that were chosen for the target imagery script. None of the participants chose gambling, risky sex or reckless driving as target behaviours for their imagery script.

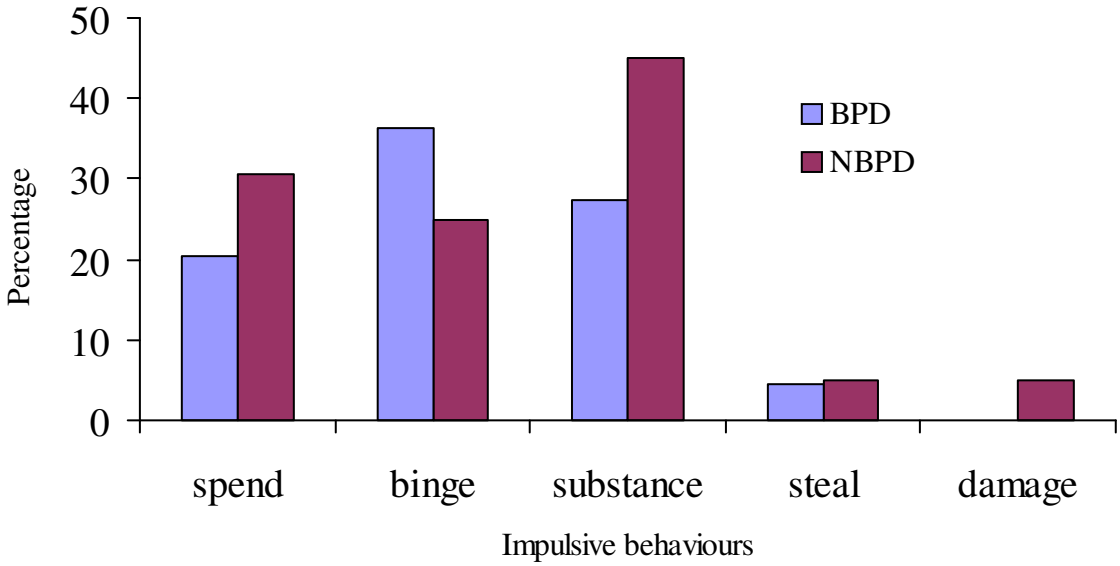


Figure 8. Impulsive behaviours chosen by BPD and NBPD participants for imagery script.

Psychophysiological data

The interaction effect that was demonstrated for heart rate associated with NSSI in Study 1 was not significant in Study 2, however, the overall pattern was identical (see Appendix E for descriptive statistics). There was a script main effect for heart rate $F(3, 120), = 3.9$, $p = .02$, Fisher's LSD = 2.0. The mean heart rate for each script were: Impulsive, 76.0 (SD = 12.6); NSSI, 77.4 (SD = 12.1), Accidental injury, 76.6 (SD = 13.3), and Neutral, 74.2 (SD = 12.1). In terms of script differences, the Impulsive, NSSI and Accidental injury scripts were all associated with higher heart rate than the Neutral script, but there were no other differences.

Despite the absence of a statistically significant result, it is worthwhile to examine the pattern of responses for the two groups across the stages of the scripts.

These are presented in Figure 9. The pattern of differential response to the NSSI script for the two groups was evident. Also, it was apparent that the impulsive script did not mirror the arousal increase response to NSSI in the BPD group seen in Study 1, nor did it mirror the arousal decrease response in the NBPD group.

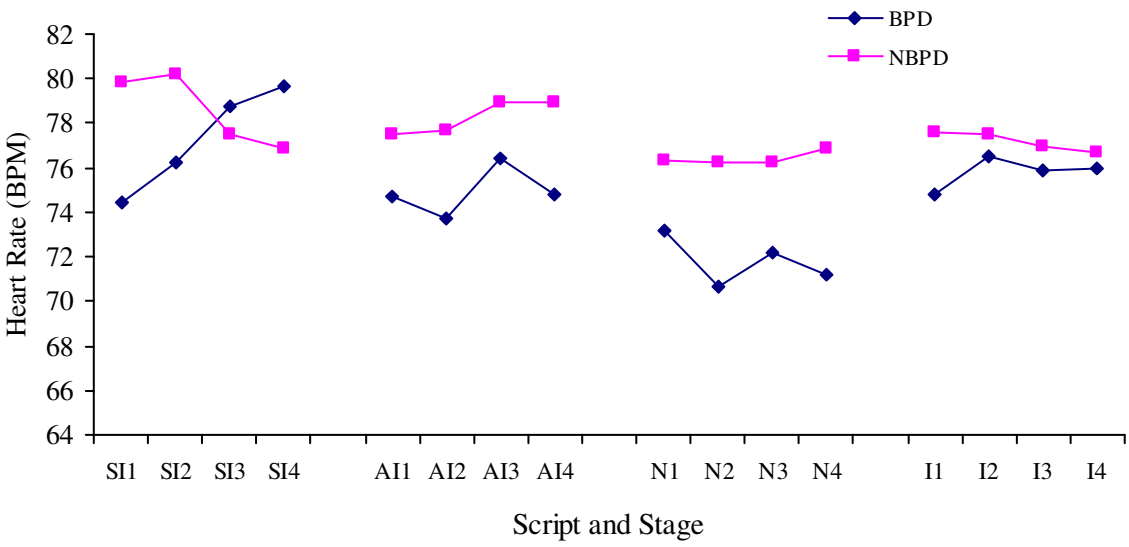


Figure 9. Mean heart rate at each stage for each script for BPD and NBPD groups.

Psychological data

There were no significant group interactions for any of the VAS ratings. Script by stage analyses then were conducted. There was a significant script by stage interaction for tension, $F(9,360) = 18.0$, $MSE = 9136.2$, $p = .0001$; anxiety, $F(9, 360) = 17.9$, $MSE = 8739.3$, $p = .0001$; anger, $F(9,360) = 11.7$, $MSE = 5668.0$, $p = .0001$; fear, $F(9,360) = 6.6$, $MSE = 3470.5$, $p = .0001$; unhappiness, $F(9,360) = 12.8$, $MSE = 6307.7$, $p = .0001$; calm, $F(9,297) = 10.0$, $MSE = 5639.9$, $p = .0001$; relief, $F(9,297) = 12.1$, $MSE = 6926.0$, $p = .0001$; excitement, $F(9,297) = 6.2$, $MSE = 2553.8$, $p =$

.0001; agitation, $F(9,297) = 12.4$, $MSE = 7044.4$, $p = .0001$; unreality, $F(9,360) = 2.2$, $MSE = 754.0$, $p = .03$; numbness, $F(9, 360) = 2.3$, $MSE = 714.5$, $p = .02$; and control, $F(9, 360) = 4.1$, $MSE = 2468.5$, $p = .0001$. Means and standard deviations are presented in Appendix E.

For risk to life there was a script main effect only, $F(3, 120) = 10.0$, $MSE = 1740.8$, $p = .001$, Fisher's LSD = 8.9. The means and standard deviations for each script were: Impulsive 21.4 (30.7), NSSI 29.4 (31.7), Accidental injury 18.0 (28.1), and Neutral 4.9 (11.2).

Table 20 demonstrates post hoc results for script differences for each VAS. The VAS items assessed the following items: tense, anxious, anger, fear, unhappy, calm, relief, excitement, agitation, unreality, numb, and control. Participants' ratings of each of these items in response to the NSSI, impulsive, accidental injury and neutral events before, during and afterwards.

Table 20

The post hoc analysis results for script differences at each stage for VAS items for BPD and NBPD groups

VAS Item	Stage	df	*F*	*MSE*	*p*	Fisher's LSD	Differences
Tense	Scene	3, 123	52.6	37497.4	.0001	11.5	IMP<SI IMP>AI,N SI>AI,N AI<IMP SI>N N<IMP,AI,SI
	Approach	3, 123	47.7	32265.0	.0001	11.2	IMP<SI IMP>AI,N SI>AI,IMP,N AI<IMP,SI AI>N N<AI,SI,IMP
	Incident	3, 123	42.1	318473	.0001	11.9	IMP<SI,AI IMP>N SI>IMP,N AI>IMP,N N<AI,SI,IMP
	Consequence	3, 123	17.5	14887.6	.0001	12.6	IMP>N SI<AI,SI>N AI>N
Anxious	Scene	3, 123	46.2	32702.7	.0001	11.5	IMP<SI IMP>AI,N SI>IMP,AI,N AI<IMP,SI AI>N N<SI,AI,IMP
	Approach	3,123	48.0	32705.4	.0001	11.3	IMP<SI IMP>AI,N SI>IMP,AI,N AI<IMP,SI AI>N N<SI,IMP,AI
	Incident	3, 123	41.9	31840.4	.0001	11.9	N<SI,AI,IMP IMP<SI
	Consequence	3,123	20.7	18471.1	.0001	12.9	N<SI,AI,IMP SI<AI

Anger	Scene	3, 123	55.1	33636.1	.0001	10.7	SI>IMP,AI,N IMP>AI,N
	Approach	3,123	42.5	27903.9	.0001	11.1	SI>IMP,AI,N IMP>AI,N
	Incident	3,123	24.4	21135.6	.0001	12.7	SI>IMP,AI,N IMP>N
	Consequence	3,123	9.6	8882.4	.0001	13.1	SI,IMP,AI>N
Fear	Scene	3,123	28.7	16708.3	.0001	10.4	SI>IMP,AI,N IMP>AI,N
	Approach	3,123	16.1	13103.2	.0001	12.3	IMP,SI,AI>N SI>AI
	Incident	3,123	17.2	15343.5	.0001	12.9	IMP,SI,AI>N
	Consequence	3,123	14.2	13202.2	.0001	13.1	IMP,SI,AI>N
Unhappy	Scene	3,123	37.8	30818.5	.0001	12.3	SI>IMP,AI,N IMP>AI,N
	Approach	3,123	27.1	23812.6	.0001	12.8	SI>IMP,AI,N IMP>AI,N
	Incident	3,123	27.7	23532.4	.0001	12.6	SI>IMP,N AI>N,IMP IMP>N
	Consequence	3,123	16.1	16023.8	.0001	13.6	IMP,SI,AI>N
Calm	Scene	3,102	31.2	24281.3	.0001	13.2	SI<IMP,AI,N IMP<AI,N AI<N
	Approach	3,102	37.0	25355.8	.0001	12.4	SI<IMP,AI,N IMP<AI,N AI<N
	Incident	3,102	23.6	18825.4	.0001	13.4	SI<IMP,N IMP>AI IMP<N AI<N
	Consequence	3,102	14.1	12791.3	.0001	14.3	N>IMP,SI,AI SI>AI

Relief	Scene	3, 102	19.2	13204.0	.0001	12.4	SI<IMP,AI,N IMP<AI,N
	Approach	3,102	19.0	12946.0	.0001	12.4	SI<IMP,AI,N IMP<N IMP <AI,N
	Incident	3,102	7.8	8522.4	.0001	15.7	SI>AI SI<N SI>IMP AI<N
	Consequence	3,102	6.0	7156.9	.0009	16.4	SI>AI IMP,AI<N
Excite	Scene	3,102	7.8	5938.6	.0001	13.0	SI<IMP,AI IMP<AI
	Approach	3,102	4.0	3054.7	.01	13.0	SI<IMP,AI
	Incident	3,102	7.8	6514.8	.0001	13.7	IMP>SI,AI,N
	Consequence	3,102	4.4	3189.2	.006	12.7	SI<IMP,N IMP>AI
Agitation	Scene	3, 102	31.2	23648.2	.0001	13.1	SI>IMP,AI,N IMP>AI,N AI>N
	Approach	3, 102	29.5	21390.9	.0001	12.8	SI>IMP,AI,N IMP>N AI>N
	Incident	3, 102	25.9	21666.1	.0001	13.7	SI>I,N AI>IMP,N IMP>N
	Consequence	3, 102	17.7	15531.6	.0001	14.0	IMP,SI,AI>N AI>SI
Unreality	Scene	3, 123	19.3	11180.5	.0001	10.4	SI,IMP>AI,N
	Approach	3, 123	16.7	11442.8	.0001	11.3	SI,IMP>AI,N
	Incident	3, 123	20.0	14147.0	.0001	11.5	SI>IMP,AI,N IMP>N AI>N
	Consequence	3, 123	23.4	15787.3	.0001	11.2	IMP,SI>AI,N AI>N

Numb	Scene	3, 123	11.4	8618.1	.0001	11.8	SI,IMP>AI,N
	Approach	3, 123	13.6	10379.9	.0001	11.9	SI,IMP>AI,N
	Incident	3, 123	19.2	15247.1	.0001	12.2	SI>IMP,AI,N IMP>AI,N AI>N
	Consequence	3, 123	26.5	18565.5	.0001	11.4	SI>IMP,AI,N IMP>AI,N AI>N
Control	Scene	3, 123	22.9	17952.4	.0001	12.1	SI<IMP,AI,N IMP<AI,N AI<N
	Approach	3, 123	14.9	11232.4	.0001	11.8	SI<AI,N IMP<AI,N AI<N
	Incident	3, 123	14.4	13884.2	.0001	13.4	SI,AI,IMP<N
	Consequence	3, 123	15.1	14595.4	.0001	13.4	IMP,SI,AI<N

Note: IMP = Impulsive script, SI = Self-injury script, N = Neutral script, AI = Accidental injury script

Post hoc analyses indicated that the Impulsive, NSSI, and Accidental injury were associated with significantly higher ratings of risk to life than the Neutral script and that the NSSI script was associated with higher ratings for risk to life than the accidental injury script.

Across stage changes were then analysed. These results compare participants' ratings of tension, anxiety, anger, fear, unhappiness, calm, relief, excitement, agitation, unreality, numbness and control across each stage (scene, approach, incident, consequence) of each script (NSSI, accidental injury, impulsive, and neutral). These post hoc results are demonstrated below in Table 21.

Table 21

The post hoc analysis results for across stage changes for each script for the BPD and NBPD groups for VAS items

VAS Item	**Script**	**df**	***F***	***MSE***	***p***	**Fisher's LSD**	**Differences**
Tense	NSSI	3,123	21.8	15820.3	.0001	11.6	1,2,3>4
	AI	3,123	29.2	151661.9	.0001	9.8	1,2<3,4
	N	3,123	.3	44.8	ns		
	IMP	3,123	.9	745.9	ns		
Anxious	NSSI	3,123	18.7	13949.2	.0001	11.8	4<1,2,3
	AI	3,123	29.1	1447.7	.0001	9.6	1,2<3,4
	N	3,123	.9	135.4	ns		
	IMP	3,123	.2	156.8	ns		
Anger	NSSI	3,123	14.0	93530.9	.0001	11.2	1,2,3>4
	AI	3,123	15.6	8816.0	.0001	10.3	1,2<3,4 3>4
	N	3,123	.4	29.3	ns		
	IMP	3,123	.3	216.2	ns		
Fear	NSSI	3,123	1.3	913.4	ns		
	AI	3,123	19.4	11506.9	.0001	10.5	1,2<3,4 1<2
	N	3,123	.7	64.2	ns		
	IMP	3,123	2.2	1759.6	ns		

Unhappy	NSSI	3,123	5.5	3110.2	.002	10.3	1,2,3>4
	AI	3,123	25.6	16735.3	.001	11.0	1,2<3,4
	N	3,123	1.2	146.9	ns		
	IMP	3,123	.8	417.6	ns		
Calm	NSSI	3,102	17.6	11105.1	.0001	11.9	1,2<3,4 3<4
	AI	3,102	9.1	7346.9	.0001	13.5	1,2>3,4
	N	3,102	.8	67.4	ns		
	IMP	3,102	.9	616.5	ns		
Relief	NSSI	3,102	29.3	20135.4	.0001	12.4	1,2<3,4 3<4
	AI	3,102	5.7	3929.6	.002	12.5	1,2>3 1>4
	N	3,102	1.7	467.4	ns		
	IMP	3,102	4.7	3541.8	.005	13.0	1,2<3 1<4
Excitement	NSSI	3,102	1.7	783.4	ns		
	AI	3,102	8.7	5394.1	.0001	11.8	1,2>3,4
	N	3,102	2.7	522.1	ns		
	IMP	3,102	3.9	1798.8	.02	10.2	1,2<3 3>4
Agitation	NSSI	3,102	10.6	8089.3	.0001	13.1	1>3,4 2>3,4 3>4
	AI		14.1	1168.0	.0001	13.6	1,2<3,4
	N	3,102	1.2	28.8	ns		
	IMP	3,102	1.8	1560.5	ns		

Unreality	NSSI	3,123	1.5	906.4	ns		
	AI	3,123	7.1	2943.5	.0002	8.8	1<3,4 2<3
	N	3,123	1.7	186.1	ns		
	IMP		2.8	1053.9	.05	8.4	1,2<4
Numb	NSSI	3,123	5.0	2619.8	.003	9.9	1<3,4 2<4
	AI	3,123	5.1	1856.4	.003	8.2	1,2<3,4
	N	3,123	2.2	79.4	ns		
	IMP	3,123	2.8	1162.9	.04	8.7	1,2<4
Control	NSSI	3,123	1.7	1316.0	ns		
	AI	3,123	9.3	7269.2	.0001	12.1	1,2>3,4
	N	3,123	.3	101.2	ns		
	IM	3,123	3.4	2290.5	.03	11.3	1,2>4

Note: 1 = Scene, 2 = Approach, 3 = Incident, 4 = Consequence

DISCUSSION

Group differences in frequency and type of impulsive behaviours

Generally speaking, it was apparent that there were comparatively few differences between individuals with BPD and individuals without BPD in terms of the range, frequency, and duration of impulsive behaviours in which they engaged. In addition, the two groups demonstrated similar patterns in help-seeking behaviours. However, there was a small number of noticeable differences. Firstly, it was of note that more individuals with BPD than expected reported having ever engaged in binge eating. Furthermore, the number of these BPD individuals currently engaging in

binge eating was greater than expected. Binge eating frequently has been associated with BPD (Sansone et al., 2008; Selby et al. 2010).

Some researchers have suggested that there are no significant differences in bingeing or purging behaviour between individuals with and without BPD (e.g., Zeeck et al., 2007). However, it is worth noting that research in this area has tended to lack a well-defined assessment of BPD (Marino & Zanarini, 2001). Other studies have demonstrated that individuals with Bulimia Nervosa (BN) and BPD have significantly impaired executive function compared to individuals with BN without BPD (Bourke et al., 2006). In the absence of a formal eating disorder assessment, it is difficult to speculate what percentage of the BPD group in the current study also may have met the diagnostic criteria for an eating disorder. Of course, it is possible that the frequency and duration of binge eating endorsed by participants would not be enough to meet the diagnostic criteria for an eating disorder; hence results discussed here are largely speculative. The matter will be further addressed in Study 3.

A greater number of individuals with BPD than expected also were currently engaging in impulsive damage to property. This fits with research regarding impulsive aggressive behaviours associated with the disorder (e.g., Schmitz, 2005), and perhaps with the literature on anger in BPD which will be discussed in greater detail in Study 3. As mentioned previously, property damage has been regarded as an important example of dysregulated behaviour in BPD (Albrecht & Porzig, 2003 cited in Ebner-Priemer, 2008; Selby et al., 2010) and some authors have provided accounts of patients breaking or damaging their own or others' items of value (e.g., Gunderson & Links, 2008). However, this behaviour is not something which has been well researched to any great degree. Nevertheless, it may be possible to discuss this

finding within the context of the research literature on impulsive violence and personality.

In the research literature on impulsive violence and personality, McMurran and Howard (2009) suggested that impulsive violence can be associated with either positive or negative emotional states. When accompanied by negative affect, impulsive violence tends to be explosive or reactive and associated with subjective distress. Behaviourally, this often is described as 'acting out'. This form is likely to be associated with the emotional dysregulation noted in BPD and secondary psychopathy. When associated with positive affect, impulsive violence manifests behaviourally as thrill-seeking and increasing levels of stimulation. When this occurs, it tends to be associated with psychopathy and ASPD

Affective impulsivity and emotional dysregulation are more likely to occur in secondary psychopathy (Blackburn, 1998). BPD individuals also have been shown to demonstrate the passive avoidant deficit that is a behavioural marker of the response modulation deficit (Hochhausen et al., 2002). Individuals with BPD are known to express physical tension and/or distress by engaging in physical demonstrations of their distress, such as NSSI, substance use and angry outbursts (Selby et al., 2010). There also is anecdotal evidence in the literature about individuals with BPD engaging in property damage in the height of distress (e.g., Albrecht & Porzig, 2003 in Ebner-Priemer et al., 2008). In the current study, some participants provided anecdotal accounts of their impulsive, destructive behaviour. For example, one individual described burning all of her photographs including those of her wedding and her children because her partner would not accompany her to the supermarket.

Clinical observations of BPD would indicate that many of these individuals

may believe that the only way to cope with their distress is to engage in a physically destructive act in order to reduce psychophysiological arousal (Albrecht & Porzig, 2003 Ebner-Priemer et al., 2008). Certainly, the contributing factors of affective instability, relationship difficulties and inappropriate anger may contribute to the choice of a physical outlet for anger that is destructive. However, after engaging in property damage, the individual may regret the fact that valuable items have been destroyed, and feel a further sense of being out of control.

Psychophysiological responses to impulsive behaviours

The hypothesis that engaging in impulsive behaviours would elicit an excitement response for those individuals with BPD and a tension reduction response for individuals without BPD was not supported. Similarly, the prediction that the responses to impulsive behaviours would mirror the arousal increase and decrease for NSSI as demonstrated in Study 1 also was not supported. There appears to be several possible reasons why this expected pattern did not occur. Firstly, it may be the case that BPD status has little effect on individual's reactions to engaging in impulsive behaviours. Certainly, there has been very little research evidence which has examined whether or not this is the case. If it was true that there was no meaningful distinction between the two groups, then this could indicate that although impulsivity is an important symptom in BPD, the affect regulatory function underlying the behaviour is not conceptually different for other groups of individuals who engage in impulsive behaviours. In this way, it may be the case that therapists would not need to apply a specific treatment approach when assisting individuals with BPD manage their impulsive behaviours.

Secondly, it is possible that by permitting individuals to choose an impulsive behaviour to discuss, the range of impulsive behaviours included for the impulsive script introduced too much variation in responding. A greater number of participants may have permitted the data to be reduced to an examination of specific impulsive behaviours to compare specifically with NSSI. Future research may wish to compare behaviours more directly, such as binge eating with NSSI, as the research has indicated that the affect regulatory function of these behaviours is to reduce arousal (e.g., Selby et al., 2008). However, within the time constraints of the current study it was felt that limiting the examination of responses to impulsive behaviours to only one or two behaviours would perhaps be too restrictive in the early stages of this research. In addition, the evidence that different impulsive behaviours may be more likely to occur under positive or negative affect among different individuals could be explored further in terms of the implications for treatment, but this was outside the scope of the current research.

The current study aimed to include responses from males as well as females, and the research literature suggests that the majority of individuals who engage in binge eating are female (Mitchell et al., 2008). Although the total number of male participants in the current study was small, it is of note that none of these participants chose binge eating as the targeted behaviour for the impulsive imagery script. As such, a specific investigation of NSSI and binge eating would be possible only for an entirely female sample of BPD and NBPD individuals.

Thirdly, a possible limitation may be that a large percentage of individuals chose substance use for their impulsive script, and may not have recalled these events as directly or in sufficient detail to evoke an emotional response because of

intoxication levels at the time the targeted event occurred. The degree to which participants are able to image accurately the incident and consequence stages of the imagery script after taking substances has also been raised in research investigating self-poisoning (e.g., Driscoll, 2002; Driscoll et al., 1997). However, in the current study the validity ratings for the VAS items *how clear was the image of yourself in that scene?* and *how close was that scene to what actually happened*? (i.e., "how clearly could you imagine yourself in that scene?", and "how close to real life was that scene?") were within normal limits. Therefore, it seemed that none of these three suggestions can completely account for the lack of group differences in the current results, so other possibilities must be explored.

Perhaps the most likely explanation for the current findings is that the ways in which individuals respond to NSSI may share similarities with specific impulsive behaviours, but these responses are not easily generalisable to other impulsive behaviours overall. For example, it is likely to be true that for some individuals, engaging in binge eating serves a similar function to NSSI in that the two behaviours are used as a behavioural strategy for lowering arousal. However, for others they may try other impulsive behaviours as alternatives to NSSI in an attempt to alter their mood or change their arousal level, but find that these other behaviours are not as rewarding. It is worth noting that the current study did not ask participants whether or not they ever engaged in other impulsive behaviours (e.g., substance use) as an alternative to NSSI, or if they even considered NSSI to be an impulsive behaviour. It is true that there are individuals who engage in NSSI but do not experience any particular psychological or psychophysiological benefits as a consequence. Hence, it may be likely that there are individuals who engage in other impulsive behaviours

without necessarily experiencing any significant degree of psychological or psychophysiological reinforcement. Their decision to engage in the behaviour may not be motivated by affect regulation but by other factors such as modelling. In this way, it may be inaccurate to assume that because some individuals find NSSI rewarding due to the psychological and psychophysiological benefits they receive, then they must find other impulsive behaviours rewarding as well. Comparisons of self-reported reactions before, during and after engaging in NSSI and other impulsive behaviours, as well as motivational factors will be discussed in a subsequent section.

Psychological responses to impulsive behaviours

Again, there were no significant group differences in terms of psychological responses to impulsive behaviours on the VAS items. In a similar pattern of responding observed in Study 1, individuals generally did not associate positive emotions with NSSI. As the differences comparing NSSI to accidental injury and neutral scripts were very similar to VAS results for Study 1, discussion of psychological responses here will focus on reactions comparing NSSI and impulsive scripts.

In terms of negative emotions, it was apparent overall, that individuals were significantly more tense, anxious, angry and unhappy during the NSSI script than they were for the impulsive script or control scripts. They also reported higher levels of agitation during the NSSI script than they did for the impulsive script. Future research may wish to consider the potential role of negative affect at baseline. It could be the case that if participants come to the laboratory in negative mood, or are high in imagery ability then this may influence their responses to the imagery. One

study indicated that individuals with higher imagery ability may show greater subjective responses to both stress and relaxation imagery (Johnsen & Lutgendorf, 2001). However, there is little indication in the research literature that these factors have any major contributions in this regard.

Additionally, participants were more fearful during NSSI, impulsive and accidental injury scripts than they were for the neutral script. This perhaps indicates that the affect regulatory function for NSSI is stronger than it is for impulsive behaviours. It also may provide some indication that although NSSI is frequently regarded as an impulsive behaviour, the emotional concomitants of this behaviour are unique to NSSI and, therefore, caution should be applied when including NSSI in a discussion about impulsive behaviours in general.

If NSSI is to be considered as an impulsive behaviour, then perhaps it is distinct from other impulsive behaviours in the affect regulation function that it serves. One of the ways in which NSSI may be unique is demonstrated by the magnitude of negative emotions that individuals experience before engaging in the behaviour. Research consistently has demonstrated that NSSI is primarily motivated by negative emotions, particularly those that result from negative interpersonal encounters (Nock & Prinstein, 2004). The same does not appear to be true for other impulsive behaviours, as negative emotions were not identified as precipitants for every impulsive behaviour in the current study. In addition, the degree of automatic negative reinforcement that NSSI provided did not appear to be captured in other impulsive behaviours. This is not to say that individuals do not experience negative emotions before engaging in behaviours such as binge eating or substance use, but the intensity of these negative emotions does not appear comparable to NSSI.

Why this specific pattern of automatic negative reinforcement occurred with NSSI but not necessarily other impulsive behaviours warrants further investigation. One explanation could be that it is the physical act of damaging body tissue, and the resultant effect from this damage that makes NSSI unique to other impulsive behaviours. Although binge eating and substance use may involve a degree of physical damage to the body, it could be argued that this damage is not as direct or immediate as that inflicted from NSSI. Research indicates that the majority of individuals who engage in NSSI do not feel pain when they engage in the behaviour (Nock & Prinstein, 2004). However, research has indicated that for individuals who experience opioid deficiencies, engaging in self-cutting may be particularly rewarding (e.g., New & Stanley, 2010). In this way, it may be the case that engaging in other impulsive behaviours does not provide the same level of psychophysiological reward for the individual that is experienced during NSSI. If these findings were to be replicated then it may contribute to further understanding of NSSI as a uniquely different impulsive behaviour.

In terms of positive emotions, individuals were less calm during the NSSI script than they were for the impulsive, neutral and accidental injury scripts. Additionally, they felt less relief during the NSSI script than they did for the impulsive script, except at the incident stage where NSSI brought more relief than did engaging in the impulsive behaviour. For excitement, NSSI was generally associated with less excitement than the impulsive behaviour. Again, this demonstrates that although the affect regulation function of NSSI compared to other impulsive behaviours is still largely unknown, it is important to include an assessment of positive as well as negative emotions when considering individuals'

responses to behaviour. It may also provide some further evidence that at least some impulsive behaviours are consistent with novelty seeking motivations (Gil, 2005; Teese & Bradley, 2008).

For ratings of unreality, numbness and control it was evident that feelings of unreality during NSSI and impulsive scripts were relatively similar, although ratings of unreality were higher for the NSSI script than the impulsive script at the incident stage. Feelings of numbness were similar for NSSI and impulsive scripts at the scene and approach stages, but NSSI was associated with higher ratings of numbness than the impulsive behaviour at the incident and consequence stages. This is consistent with previous literature indicating that NSSI is associated with dissociation and depersonalisation (Favazza & Conterio, 1989; Ross & Heath, 2003). Research also has paired dissociation with binge eating (e.g., Fuller-Tyszkiewicz & Mussap, 2008) and with gambling (e.g., Grant & Kim, 2003). The results in the current study may indicate that some individuals engage in impulsive behaviours to distract themselves from unpleasant emotions and, perhaps, are able to depersonalise while engaging in that behaviour. However, it appears that NSSI is more strongly associated with experiences of depersonalisation in comparison to other impulsive behaviours.

NSSI and impulsive behaviours shared similar ratings of control in that these behaviours were associated with lower ratings of control compared to accidental injury and neutral scripts, but it was noted that participants felt less in control in relation to NSSI during the scene stage than they did for their impulsive behaviour.
It is interesting that individuals reported stronger feelings of control in relation to behaviours over which no control was objectively exerted (i.e., the accidental injury), whereas they reported lower feelings of control in relation to the behaviours in which

they voluntarily engaged (i.e., NSSI and impulsive behaviour). These reported lower feelings of control in relation to NSSI possibly can be explained by the high levels of distress that were associated with engaging in this behaviour. This is consistent with the research supporting the UPPS (Urgency, Premeditation, Perseverance, and Sensation seeking) model of impulsivity (Whiteside & Lynam, 2001) applied to NSSI. This model suggests that individuals who engage in NSSI experience high levels of negative *urgency*, and quickly engage in the behaviour when high levels of negative affect are present (e.g., Glenn & Klonsky, 2010). It has been suggested that this is also likely to be the case for other seemingly similar impulsive behaviour (Lynam et al., 2011). However, as previously reported, individuals in the current study indicated that they did not feel as distressed during impulsive behaviours as they did during NSSI. This finding for low feelings of control during impulsive behaviours might then by explained by the extent to which the individual can choose to engage or not engage in behaviour. Within the UPPS model, the construct *lack of perseverance* refers to the individual's tendency to give up in the face of boredom or frustration (Lynam et al., 2011). This construct perhaps could be associated with lowered feelings of control. It may be the case that the urge to engage in an impulsive behaviour gets to the point where it feels like it is beyond the individual's control. In this way, future research might focus on the presence or absence of high levels of distress, and the role of perseverance and self-reported feelings of control in relation to impulsive behaviours.

Looking across the stages of the scripts, the results for tension, anxiety, anger, fear, unhappiness, calm, and agitation on the impulsive script were all not significant. This indicates that negative feelings were not strongly associated with the impulsive

behaviour at any point of the four stages in the imagery script. This is dissimilar to the findings for the NSSI script where high levels of negative emotions preceded the behaviour, and were replaced with positive feelings (calm) during the incident and consequence stages of the script. However, there were significant results for relief, where the scene and approach stages of the impulsive script were associated with less relief than the incident stage, and the scene was associated with less relief than the consequence stage. This, in part, demonstrates some evidence that there may be at least a perceived affect regulatory function to impulsive behaviours which is similar to NSSI. Certainly, the research literature has indicated that individuals report engaging in binge eating and substance use to lower arousal (e.g., Selby et al., 2008).

In addition, participants reported less excitement during the scene and approach stages of the impulsive script than they did for the incident stage, and that the incident stage also was significantly more exciting than the consequence stage. Again, this may be consistent with research literature indicating that some impulsive behaviours such as excessive spending and gambling are associated with sensation seeking and a desire to pursue activities that are exciting (Clark & Calleja, 2008; Shead & Hodgins, 2009). It is interesting that high levels of excitement were not reported before engaging in the impulsive behaviour as recent research (e.g., Lynam et al., 2011) has identified the role of *positive urgency* in impulsive behaviours. Positive urgency refers to the individual's tendency to engage in impulsive behaviours under conditions of heightened positive affect. From the results in the current study, it appears that this state of heightened positive affect was not apparent until the individual actually began engaging in the behaviours during the incident stage. This would perhaps indicate that the role of urgency alone is insufficient to

explain why people engage in impulsive behaviours. Other factors such as lack of perseverance (the tendency to give in to feelings of boredom and frustration) may be more important.

For ratings of unreality and numbness, participants indicated that they experienced significantly less dissociation (unreality and numbness) during the approach stage of the impulsive script than they did for the consequence stage. However, they felt significantly greater levels of control during the approach stage than they did for the consequence stage of the impulsive script. This is again consistent with findings that feelings of dissociation during binge eating may mediate subsequent experiences of lower levels of control over this behaviour (Fuller-Tyszkiewicz & Mussap, 2008). Of course, experiences of dissociation and loss of control would also be expected for individuals who use substances. Interestingly, results from the current study appear to indicate that feelings of dissociation and loss of control may be experienced differently for impulsive behaviours such as substance use and binge eating than they are for NSSI.

The research identifies that increased feelings of dissociation would most likely result in lowered feelings of control, and that dissociation is generally experienced as an unpleasant negative emotional state, which serves to protect individuals from heightened levels of distress (Cole & Putnam, 1992; Stiglmayr et al., 2001). NSSI has been identified as a behavioural strategy which some individuals use to end these unpleasant feelings of dissociation (Brodsky et al., 1995; Farber, 2008; Zlotnick et al., 1997). In the current study, the results indicated that engaging in the impulsive behaviour leads the individual to feel less in control, but also more excited. It would appear then, that the feeling of being out of control in this particular

context was a positive experience for individuals.

Motivations for engaging in impulsive behaviours

The hypothesis that individuals with BPD would more strongly endorse external motivations (e.g., communicating anger towards others), whereas individuals without BPD would more strongly endorse internal motivations (e.g., tension reduction) was not supported. There were no group differences between BPD and NBPD groups in terms of their motivations for engaging in impulsive behaviours, but overall participants from both groups more strongly endorsed internal rather than external motivations. It was expected that internal motivations would be a significantly motivating factor for engaging in NSSI for the NBPD group, so this finding partially supports this hypothesis. For the MIBS-I and MIBS-II, depression was a significant motivating factor for engaging in impulsive behaviours. This makes sense, given that binge eating, substance use and other impulsive behaviours all have been associated with low mood states and depressive symptoms as a motivation for engaging in the behaviour (Ambwani, 2009; Selby et al., 2010).

In terms of external or operant motivations, it is apparent that participants did not consider influencing the behaviour of others to be a contributing factor for engaging in impulsive behaviours. Although this is possible, it seems more likely that participants either were not able to recognise this as a contributing factor, or that they were not willing to admit the influence of external factors on their behaviour. Given the interpersonal difficulties experienced by those with BPD, it was hypothesised that individuals with BPD would more strongly endorse external motivations than the NBPD group. This was not the case. What this seems to further demonstrate is that

BPD individuals, in particular, may have fundamental difficulties in interpreting their emotional states and subsequent behaviour (Guttman & LaPorte, 2002; Webb & McMurran, 2008; Williams, 2006).

This is interesting given that during the interview for the imagery script, several participants gave anecdotal accounts of interpersonal disputes as part of setting the scene of events that led up to the individual engaging in the targeted impulsive behaviour. For example, several participants with BPD described arguments or similar negative interactions with a significant other that occurred moments before engaging in substance use, binge eating and other impulsive behaviours. Perhaps it is the case that when participants took the MIBS questionnaires home to fill out later, they may have re-attributed their motivations for the behaviour. This certainly would fit with one of the fundamental principles of Mentalization Based Treatment (MBT; Bateman & Fonagy, 2006) for BPD, which emphasises the tendencies that these individuals have to be impression driven, and to make inaccurate, implicit assumptions about thoughts, emotions and behaviours (Bateman & Fonagy, 2006). Verbal administration of the questionnaires may resolve this problem. The researcher could remind the participant to be clear about which mind state s/he is referring to at the time. For example, individuals with BPD may struggle to separate 'how I feel right now' from 'how I felt at the time when I was engaging in that behaviour', which is what these questionnaires were trying to establish.

It is known that individuals with BPD have extremely fleeting emotions (Skodol et al., 2011a, 2011b), which is perhaps likely to impact on how they retrospectively appraise their feelings about a situation (Paris, 2000, 2008). This is

something which has been shown to be reflected in BPD individuals' recollections of childhood and associated reports of abuse (Paris, 2000). Similarly, in a therapeutic context it has been noted that BPD individuals' ability to cope with their therapists' interpretations of their behaviour can fluctuate greatly within one hour, depending on the patient's mood state at any given time (Fertuck, 2011).

There also is some indication that the area of affect-laden information processing in relation to neuropsychological functioning in BPD has been grossly overlooked in the research literature (Mensebach et al., 2009). Research has been concerned with the question of how emotional states facilitate or inhibit neuropsychological processes such as information processing (Cole et al., 1994; Mensebach et al., 2009). A recent study also reported an enhanced retrograde and anterograde amnesia in patients with BPD in response to the presentation of negative valenced stimuli (Hurlemann, Hawellek, Maier, & Dolan, 2007).

If it is the case that individuals with BPD have difficulty in providing a consistent account of their feelings and motivations, then this may impact on future choice of methodology when talking to individuals with BPD about their thoughts, feelings and behaviour. For example, it has been speculated that individuals with BPD have greater need for face-to-face contact, over phone or other contact because, without it, they may become suspicious and make inaccurate appraisals about their therapist's behaviour (Fertuck, 2011). It may be the case that for individuals with BPD, talking about their behaviour and writing about the same behaviour does not necessarily result in a consistent appraisal about that behaviour overall.

Given what has been demonstrated so far in Study 1 with individuals with BPD being unable to accurately label emotions (e.g., stating they feel calm despite a

noticeable increase in heart rate), it may be worth considering that obtaining data through self-report is not an accurate way of determining affect in BPD. In the same way that participants could not accurately identify their emotional responses using a visual rating scale, perhaps the use of questionnaires is less reliable than methods such as interview when working with this group. As stated previously, there is clearly a need to further examine the role of alexithymia in BPD and the accuracy with which these individuals can identify emotions without aides such as prompting. According to Ebner–Priemer and colleagues (2007), individuals with BPD do not necessarily have difficulties differentiating emotions due to lack of skill, but their difficulties depend on the level of tension they are experiencing at the time.

Furthermore, Stiglmayr and colleagues (2008) suggested that tension is experienced by people with BPD as 'white noise' which, if it reaches a critical level, makes information about emotion impossible to interpret. Future research may wish to consider this, as well as the role of retrospective memory in individuals with BPD, to see how much their self-reported motivations for behaviour remain consistent. Similarly, it would be interesting to further assess the role of BPD responding using other, objective means of data collection. For example, it may be possible to examine the nonverbal behaviour of BPD individuals using micro-expression detection, as research evidence has suggested that facial expressions are of prime importance in the leakage of suppressed affective reactions (e.g., Warren, Schertler, & Bull, 2008). In this way, it may be possible to examine *process* versus *content* in the context of borderline pathology to see if there is consistency between what the individual says s/he feels (e.g., "I feel calm") and his/her nonverbal behaviours such as facial expressions.

Responses to impulsive behaviours: Group differences

The hypothesis that individuals' reasons for engaging in impulsive behaviours would relate to sensation seeking for the BPD group but a sense of calm for the NBPD group, had only limited support. Overall, there were few group differences in ratings on the RIBS. Of interest was the fact that the BPD group reported feeling more excited before engaging in risky sex than the NBPD group. This indicates that there may be some evidence that for individuals with BPD, risky sexual behaviours are likely to be associated with sensation seeking.

Looking at the reactions of each group to each stage of risky sex, it was apparent that the BPD group were significantly more excited than they were calm, sad or distressed before engaging in risky sex, but they also reported feeling significantly calmer than distressed before engaging in the behaviour. This indicates that for individuals with BPD, emotions before engaging in risky sexual behaviours are likely to be positive rather than negative. A similar pattern was evident when thinking about their emotions during the behaviour. Individuals were significantly more excited than calm, sad or distressed during risky sex, and they were also significantly calmer than sad or distressed. This is consistent with previous research indicating that reckless sexual behaviour is consistent with novelty seeking (Gil, 2005), and generally a high risk but pleasurable experience (Teese & Bradley, 2008). There were no significant results for emotions experienced after engaging in risky sex, and there were no significant differences at all for the NBPD group.

According to Masters and Johnson (1966), the typical sexual arousal response can be divided into four stage: excitement, plateau, orgasm and resolution. The

excitement response reported by individuals with BPD in the incident stage of the script fits with this pattern. However, it is not immediately apparent why this same pattern of response did not occur for the NBPD group. This group did not report significant levels of any of the four emotions (excited, calm, sad, distressed), so it is possible that the group experienced emotions that were not captured by these four emotional states. For example, it is possible that they felt numb or depersonalised during their experiences of risky sex. In general, individuals who engage in NSSI are more likely to report feelings of dissociation than individuals who do not (Favazza & Conterio, 1989; Ross & Heath, 2003). In addition, there is a relationship between NSSI, dissociation and engaging in risky sex, particularly for individuals who have experienced previous sexual abuse (Rodriguez-Srednicki & Twaite, 2006). Individuals in the current study were not specifically assessed for their experiences with sexual abuse, so it is possible that there may have been group differences in this regard which influenced the results.

In terms of explaining why risky sex was the only impulsive behaviour for which a group difference was identified, it may be useful to consider the research regarding the interpersonal experiences of individuals with BPD. It could be argued that risky sex was the only impulsive behaviour that involved direct interpersonal contact, so this may be relevant to the understanding of this difference between BPD and NBPD groups. Research has suggested the instability in relationships and affect that are experienced by individuals with BPD may explain some aspects of compulsive sexual behaviour, such as a need for multiple partners (Lloyd et al., 2007). It may be the case that there are aspects of this kind of interpersonal contact that are exciting and rewarding for individuals with BPD. Previous research has

suggested that women with BPD who engaged in risky sex demonstrated higher sexual self-esteem and greater sexual assertiveness (Hurlbert et al., 1992), and that engaging in risky sexual activity represented a desire for love and acceptance (Rickards & Laaser, 1999). It also has been suggested that individuals with BPD may use sexual 'acting out' as a way of coping with feelings of loneliness and emptiness (Montaldi, 2002; Rickards & Laaser, 1999). In this way, it may be possible that by engaging in risky sex, individuals with BPD may feel not only heightened sexual arousal, but a heightened sense of confidence and self-esteem, which results from their perceptions of intimacy and acceptance that the sexual encounter represents. Certainly, this difference in response to risky sex between BPD and NBPD groups may warrant further investigation.

Looking at across stage changes, it was evident that the BPD group were more excited before and during risky sex than they were after engaging in the behaviour. They also were significantly less sad and distressed before and during the behaviour than after. In contrast, the NBPD group were significantly less distressed before engaging in risky sex than they were after. This perhaps indicates that for the NBPD group, there may be a more direct appraisal of emotions after engaging in risky sex. This is consistent with the literature suggesting that for some individuals, risky sex is used to distract oneself from unpleasant emotions, but afterwards feelings of shame, guilt and remorse tend to emerge (Williams, 2006).

Responses to impulsive behaviours: Combined scores for both groups

When all the scores for both groups were combined, it was apparent that there were some noteworthy differences in positive and negative affect both between and

across each of the behaviours before, during and after engaging in the behaviour. Again, shoplifting and property damage were not included here as too few individuals engaged in these behaviours to make a meaningful comparison.

Firstly, differences at each stage of the impulsive behaviour for NSSI, gambling, spending, binge eating, substance use, and reckless driving will be discussed. For NSSI, the time before engaging in the behaviour was associated with significantly lower levels of calm feelings than it was sadness and distress, and excitement was significantly lower than sadness or distress. During NSSI, individuals were more likely to feel significantly greater levels of sadness than calmness or excitement, and they also were significantly more likely to feel distressed rather than excited during NSSI. This fits with previous research suggesting that for the majority of people who engage in the behaviour, NSSI serves to diminish unwanted, negative emotions (Haines, Williams, & Brain, 1995; Nock & Prinstein, 2004).

Before, during and after gambling, individuals felt higher levels of excitement and calmness than they did sadness or distress. Although feelings of calm generally have not been associated with gambling in previous literature, heightened feelings of excitement are consistent with previous research findings suggesting that individuals engage in gambling in order to seek a sense of excitement and euphoria (Grant & Kim, 2003; Schmitz, 2005; Shead & Hodgins, 2009). Previous research also has shown that gambling to enhance one's mood predicts heavier gambling behaviour, and engaging in gambling to cope with one's mood tends to be indicative of more severe gambling problems (Stewart & Zack, 2008).

Before spending, individuals reported feeling significantly less distressed

than they did calm and excited and they felt significantly lower levels of sadness than excitement. During the behaviour, they felt higher levels of excitement rather than calmness, sadness or distress but significantly calmer than sad or distressed. This is consistent with previous research indicating that individuals use spending as a means of elevating mood, and that the act of making purchases generally is associated with pleasure (e.g., Clark & Calleja, 2008). However, it generally is thought that for people who engage in excessive spending, these positive feelings are fleeting before more negative feelings return (Clark & Calleja, 2008). In the current sample, it was not the case that individuals endorsed negative feelings immediately after engaging in spending, so perhaps it is the case that they emerge at some later stage than in the immediate aftermath. These positive feelings associated with spending appear to endure after the engaging in the behaviour, but it is not possible to tell from the current results how long this positive state lasts.

Both before and during binge eating participants reported feeling significantly greater feelings of calm than excitement, sadness or distress. However, after binge eating they felt significantly lower levels of excitement than calm, sadness or distress. Previous literature generally has indicated that the individual's mood state before binge eating tends to be distressed, and that the binge serves to reduce negative emotional states (Agras & Telch, 1998; Binford et al., 2004; Mitchell et al., 2008; Stice & Agras, 1999). This distress prior to binge eating was not necessarily reflected in the current results, however, it was apparent that individuals temporarily felt more positive during the behaviour, and feelings of sadness and distress immediately followed binge eating. This is consistent with research indicating that binge eating transiently reduces negative affect, but depressed mood, guilt, and self-

criticism emerge soon after (APA, 2000). Hence, it is apparent that binge eating does not accomplish lasting mood change, even though individuals may believe this to be the case (Thayer et al., 1994).

During substance use, participants felt significantly calmer and more excited than sad or distressed. Although this response is somewhat puzzling, it could perhaps be suggested that participants were less accurate at describing the direction of positive affect (calm or excited) whilst under the influence of substances. In addition, this result may reflect a high degree of variability in substances that were taken (i.e., amphetamines and cannabis). Participants also indicated that while engaging in substance use they felt significantly greater levels of calmness rather than excitement, sadness or distress, but excitement was significantly higher than sadness or distress. This indicates that the time during and after substance use is associated with positive rather than negative emotions. Previous research consistently has indicated that the majority of individuals who engage in substance use expect to experience positive changes in mood as a result of using, and depression is a risk factor for the development of substance use (e.g., Burton, Stice, Bearman, & Rohde, 2007).

Before reckless driving, participants were significantly more likely to experience significantly lower levels of positive emotions (calm or excited) than they were to report negative feeling of sadness or distress. There has been limited research evidence to suggest whether reckless driving serves to reduce or distract from negative affect, or whether it is a behaviour which is better explained by sensation seeking motivations. Certainly, anger has been found to have a significant relationship to reckless driving (Nesbit et al., 2007), and this also has been associated

with BPD (Galovski et al., 2002; Teese & Bradley, 2008). None of the participants in the current study chose reckless driving to discuss for the imagery script, so there is limited evidence with which to speculate about the cause of participants' distress in relation to reckless driving. Future research may benefit from further exploration of internal and external motivations for this behaviour to see if interpersonal factors (e.g., arguments with someone) may act as precipitants to reckless driving in BPD.

To summarise, NSSI and reckless driving were associated with a desire to reduce or distract from negative feelings of distress and sadness. Results for gambling, excessive spending and binge eating were less clear in demonstrating a pattern in individuals' emotional state before, during and after engaging in the behaviour. It appears that gambling, excessive spending, substance use, and binge eating produced positive feelings of calmness and excitement at the time of the behaviour, and there were some consistencies with previous research literature. However, the fact that individuals identified feeling both calm and excited at the same time perhaps indicates again, that participants struggled to accurately identify what they were feeling. Participants also indicated that they felt sad and distressed during NSSI instead of calm, which is not consistent with previous research, nor is it consistent with findings from Study 1. Again, this likely reflects the fact that individuals with BPD perhaps were guessing or misinterpreting what they felt when engaging in NSSI. After engaging in impulsive behaviours, gambling and substance use were again associated with positive emotions of excitement and calmness. Only binge eating was associated with the negative emotions of sadness and distress in the aftermath of the behaviour. For individuals who engage in binge eating, it may be the case that the moments immediately after consuming food bring about feelings of

shame, guilt and regret (APA, 2000).

Clearly, none of the impulsive behaviours, including NSSI, rated on the RIBS mirror the tension reduction response demonstrated in Study 1. It is interesting that gambling was consistently associated with positive feelings at every stage of the behaviour. For the most part, spending and substance use also were viewed in a positive light. In this way, it may be the case that some impulsive behaviours are more sensation seeking in their purpose, but at this stage there is not enough evidence to suggest either which behaviours are similar to NSSI, or which behaviours serve which affect regulation function for BPD and NBPD groups.

Next, an examination of across stage differences in responses to impulsive behaviours is warranted. For NSSI only, feelings of calm were significantly lower before engaging in the behaviour than they were during and after, but these feelings of calm also were significantly lower during the behaviour than afterwards. This appears to be somewhat consistent with the previous literature on the tension-reducing properties of NSSI, at least in NBPD populations where sometimes there is a lag effect and individuals do not become calmer until they have stopped engaging in the behaviour at the consequence stage (e.g., Brain, 1998; Haines, 1994). It may be the case that there is a difference between free recall of emotional states and guided recall of emotional states, such that simple questionnaires about emotions during NSSI do not evoke the same level of detail as a guided imagery script. What it again demonstrated here is that individuals with BPD were unable to make accurate appraisals about their emotional state during NSSI.

Alternatively, it may be the case that individuals are unwilling to admit that they find NSSI exciting. It was interesting that feelings of excitement were

significantly lower before engaging in NSSI than they were during and after, as this perhaps indicates some evidence that both positive and negative emotions need to be considered when assessing reactions to NSSI. In addition, feelings of sadness and distress both were significantly higher before engaging in NSSI than they were during and after the behaviour. This, again, is consistent with previous research indicating that individuals engage in NSSI to reduce or remove negative emotional states (Chapman et al., 2006; Haines & Williams, 2003). What is not being reflected here, however, is the fact that, for some individuals, these initial negative states may make way for arousing positive states such as excitement.

For gambling, feelings of excitement were lower after engaging in the behaviour than they were both before and during. Similarly, feelings of sadness and distress were significantly higher after engaging in the behaviour than they were both before and during the behaviour. This is consistent with research indicating that positive mood alterations associated with gambling are short-lived and, perhaps, dependent on whether or not the individual is winning or losing (Shead & Hodgins, 2009).

For excessive spending, it was apparent that levels of excitement were significantly higher during the behaviour than they were before or afterwards. Similarly, levels of sadness were significantly lower during the behaviour than they were before or afterwards. Levels of distress were higher before engaging in excessive spending than they were during or afterwards. This indicates that one's emotional state before engaging in excessive spending tends to be negative, and the act of spending money itself moderates feelings of distress into feelings of excitement (Clark & Calleja, 2008). Again, it appears that negative feelings of

distress or sadness do not return immediately after spending money but, perhaps, are delayed until such a time, for example, when credit card bills are due.

For binge eating, participants reported feeling significantly calmer before engaging in binge eating than afterwards, and they also felt significantly higher levels of sadness and distress before binge eating than they did during or afterwards. Excitement was significantly lower before engaging in binge eating than during or afterwards. In this way, tension reduction as evidenced by feeling calmer during binge eating was not evidenced as was anticipated. Previous research has reported that binge eating actually may not serve to reduce distress, even though individuals who engage in the behaviour believe it to be so (Thayer et al., 1994).) It is possible that when given the option to compare binge eating with a range of other impulsive behaviours (as opposed to thinking about binge eating in isolation), individuals in the current study were able recognise that this behaviour was not as effective in reducing tension as NSSI.

For substance use, the only significant results were for feelings of sadness and distress which were significantly higher before engaging in drug use than they were during or afterwards. This is consistent with previous research indicating that individuals engage in substance use primarily to reduce or remove unpleasant, negative emotional states (Burton et al., 2007). In this sample, it did not appear that substance use was associated with sensation seeking or a desire to induce excitement in particular. As mentioned previously, if the sample size was larger than it may have been useful to separate groups further into categories of substances used (i.e., stimulants versus depressants or sedatives), and perhaps to separate alcohol from illicit substances. This is something which future research may wish to consider. It

may have been the case that, for this sample, there were significantly more individuals using alcohol and cannabis (which may have produced a numbing or dulling effect on emotions, contributing to alexithymia) than individuals using methamphetamines/amphetamines (which may be more likely to be associated with novelty-seeking and excitement). Certainly, the research has indicated that individuals who use amphetamines score highly on measures of sensation seeking (Kelly et al., 2006), whereas recent research has failed to determine that there is an important relationship between sensation seeking and cannabis use (e.g., Dorard et al., 2008). Similarly, a recent meta-analysis of 61 alcohol studies found only small to moderate correlations between alcohol use and sensation seeking (Hittner & Swickert, 2006). This would suggest that a desire for excitement and novelty is not necessarily attributable to all substances, and that where possible, research may benefit from investigating the affect regulatory function of individual substances separately.

Finally, for reckless driving, levels of sadness and distress were significantly higher before engaging in the behaviour than they were during and afterwards. This again is consistent with previous literature indicating that anger and interpersonal stressors are likely to have a relationship with reckless driving (Nesbit et al., 2007).

Again, none of the impulsive behaviours particularly mirrored the tension reduction response associated with NSSI in Study 1 or in previous literature. What is apparent is that NSSI, binge eating, substance use and reckless driving are all associated with negative feelings of sadness and distress before the individual engages in the behaviour. There is also some evidence that NSSI and binge eating are associated with increased feelings of calmness after engaging in the behaviour.

Beyond these observations, it is difficult to make any other inferences about the patterns of emotional responding to impulsive behaviours in terms of whether their purpose is more likely to be self-soothing or sensation seeking. However, to investigate this relationship further it was necessary to compare each of the impulsive behaviours with NSSI. The following section examines these results.

Responses to NSSI compared to each impulsive behaviour

When RIBS scores were combined, this allowed NSSI to be compared with each of the impulsive behaviours according to the degree of calm, excitement, sadness and distress that participants reported feeling before during and after engaging in the behaviour. Firstly, NSSI was compared with gambling. It was apparent that participants felt calmer both before and during engaging in gambling than they did before and during NSSI. They also reported feeling greater levels of excitement both before and during gambling than they did before and during NSSI. There were no significant differences for either sadness or distress when comparing NSSI with gambling. This indicates that gambling was not a behaviour that participants associated with negative emotions, but rather they viewed it positively. This is consistent with previous research suggesting that individuals who engage in gambling may be prone to boredom and seek excitement and euphoria from the behaviour (e.g., Grant & Steinberg, 2005; Schmitz, 2005). If negative emotions were apparent before individuals engaged in gambling then it appears that these were at low level, compared to NSSI, which was associated with high levels of distress before engaging in the behaviour. In this way, it may be possible that the affect regulation function of gambling is similar to that of NSSI associated with the BPD

group (i.e., low arousal before the behaviour followed by excitement), but it appears to be dissimilar to the pattern observed for NSSI in NBPD individuals.

When comparing NSSI with spending, it was apparent that participants felt calmer both before and during engaging in spending than they did before and during NSSI. Again, this highlights the apparent importance of high levels of distress as a precipitant for NSSI which may not necessarily precede other impulsive behaviours. Participants also felt more excited both before and during spending than they did before and during NSSI. Interestingly, participants felt greater levels of sadness before engaging in spending than they did before engaging in NSSI, but felt greater levels of sadness after NSSI when compared with spending. They also reported greater distress before spending than before NSSI but felt greater levels of distress after NSSI than they did for spending. The research literature has identified that many individuals use excessive spending as a means of elevating mood (e.g., Clark & Calleja, 2008; Faber, 2000; Faber & Christenson, 1996). However, it appears that this elevation in mood is short-lived and negative feelings return quickly (Clark & Calleja, 2008). Despite these negative feelings post-spending, it was apparent that the negative emotions experienced after engaging in NSSI were much stronger. This could be a reflection of the fact that NSSI may be considered more a self-destructive and less socially acceptable behaviour in comparison to excessive spending. NSSI also tends to be a private behaviour, and many individuals experience intense feelings of shame and sadness after cutting themselves (Feldman, 1988a; Hollander & Allen, 2006; Lion & Conn, 1982; Schwartz et al., 1989).

When comparing NSSI with binge eating, it was apparent that participants felt calmer before and during binge eating than they did before and during NSSI.

Interestingly, they were also more excited after NSSI than after binge eating. These results may reflect the fact that a significantly greater proportion of individuals with BPD were currently engaged in binge eating than individuals without BPD, and as demonstrated in Study 1, high arousal was associated with NSSI for this group. Participants also were more sad and distressed before a binge than they were before NSSI. This may have been due to the fact that the majority of individuals who engaged in binge eating had BPD and, therefore, were less distressed before NSSI because they were anticipating the excitement associated with this behaviour. There were no significant differences in emotional states after the event when comparing NSSI and binge eating.

When comparing NSSI with risky sex, participants reported feeling calmer before engaging in risky sex than they did before engaging in NSSI. They also were more excited both before and during risky sex than they were for NSSI. This perhaps indicates that while NSSI is a pleasurable behaviour for some, it does not necessarily induce excitement (perhaps particularly so for those without BPD). Interestingly, participants reported feeling greater levels of sadness and distress before engaging in risky sex than before engaging in NSSI. Again, none of the participants chose risky sex as a behaviour to discuss for their interview in relation to the impulsive imagery script, so it is difficult to speculate about the particular context in which this behaviour occurred. One previous study found that depression was a significant predictor for engaging in risky sexual behaviours (Paxton & Robinson, 2008), and other researchers have suggested that feelings of loneliness and emptiness often precede risky sexual behaviour (Rickards & Laaser, 1999). It may be useful for future research to identify some of the precipitants to risky sexual behaviour in order

to determine if they are similar or dissimilar to NSSI. For example, one large study identified that sexual abuse in childhood was associated with risky sex in adulthood (Oddone-Paolucci et al., 2001). It is known that some individuals who have been traumatised may engage in self-damaging behaviours (including NSSI and risky sex) which serve to re-enact the trauma in order to obtain mastery over their response to it (Trippany, Helm, & Simpson, 2006).

When comparing NSSI with substance use, participants felt calmer and more excited both before and during substance use than they did before or during NSSI. However, they felt greater levels of sadness before and during NSSI than they did before and during substance use. Overall, NSSI was associated with greater levels of distress than substance use, which suggests that the affect regulatory function of the two behaviours perhaps is dissimilar. It may be the case that episodic substance use was associated with novelty-seeking and a source of entertainment for participants in the current study, and they did not necessarily view it as an affect regulation strategy similar to NSSI.

Finally, when comparing NSSI with stealing, participants were calmer before stealing than they were for NSSI. They also reported higher levels of sadness and distress before engaging in NSSI, and they also felt sadder during NSSI than they did during stealing. Overall, stealing was associated with more excitement than NSSI. In this way, stealing appeared to serve a different affect regulation function to NSSI, in that its purpose seemed to be meeting sensation seeking motivations. This is somewhat inconsistent with previous research identifying the tension-reducing properties of shoplifting (e.g., Fishbain, 1987; Gudjonsson, 1987; McConaghy & Blaszczynski, 1988; McElroy et al., 1991). Again, perhaps it is the case that the

current sample did not represent a group of individuals who has a significant problem with stealing, but who engaged in infrequent acts of shoplifting for the purposes of inducing excitement. It is possible that their responses would be different to those individuals who experience anxiety associated with more frequent and compulsive urges to steal.

In summary, it appears that participants generally felt calmer before engaging in most other impulsive behaviours than they did before engaging in NSSI. They also felt calmer during gambling, spending, binge eating, and substance use than they did during NSSI. However, they did not feel calmer after any of the impulsive behaviours than they did after engaging in NSSI. This further illustrates the tension reduction properties of NSSI that are felt after engaging in the behaviour. Participants also felt more excited before gambling, spending, binge eating, risky sex and substance use than they did before NSSI. They also felt more excited during gambling, spending, substance use and risky sex than they did during NSSI. Again, it may be the case that it is more socially acceptable to endorse these behaviours as exciting. The DSM-IV-TR (APA, 2000) emphasises the experiences of negative affect and mounting tension prior to engaging in an impulsive behaviour, however it is apparent from the current study that some impulsive behaviours appeared to have little relationship to perceived stress. It may have been the case that participants did not identify behaviours such as gambling or shoplifting as similar to NSSI, and rather saw these as means of seeking excitement and entertainment. In this way, it is possible that although NSSI is frequently discussed in the context of impulsive behaviours in the literature, individuals who engage in these behaviours may view NSSI quite separately. It may then be useful for future research to ask participants

how similar or dissimilar they perceive behaviours such as engaging in substance use and shoplifting to be in comparison to NSSI in relation to the immediate costs and benefits of the behaviours.

In terms of negative emotions, participants felt more distressed before engaging in spending, binge eating and risky sex than they did before NSSI. It may be of benefit for future research to closely examine the precipitants of these behaviours in order to determine the cause of this distress, to see if they are similar or dissimilar to NSSI. Depression has been associated spending, binge eating and risky sex (e.g., McElroy et al., 1995; Paxton & Robinson, 2008; Vollrath, Koch, & Angst, 1992), and indeed, depression was the only significant motivation for engaging in impulsive behaviours on the MIBS scale.

However, none of the impulsive behaviours were associated with greater levels of distress than NSSI while engaging in the behaviour. This indicates that although NSSI is perceived as contributing to increased positive feelings, individuals are still distressed by their behaviour. Overall, it appears that none of the other impulsive behaviours share the degree of emotional intensity that is attached to NSSI. This could indicate that although NSSI might be considered impulsive, the emotional concomitants surrounding the behaviour are quite distinct from behaviours such as binge eating, excessive spending and risky sex.

Similarly, NSSI was more distressing than spending when considering emotional states after engaging in these behaviours. This indicates that the distress and feelings of guilt and shame that individuals feel after engaging in excessive spending (e.g., Clark & Calleja, 2008) are not experienced as intensely as they are after NSSI. This is despite the fact that individuals generally demonstrated a low

level of arousal after engaging in NSSI (as demonstrated in Study 1). Information about the extent of damage associated with excessive spending in the current study (e.g., amounts of money spent and subsequent problems associated with debt) are unknown, however, it is likely that the effects of this damage may not have been as immediate. Of course, it could be argued that the self-damaging aspects of NSSI were more immediately apparent (e.g., needing to stem bleeding), and that seeing the results of this damage was more distressing by comparison to the immediate effects of excessive spending.

Levels of sadness were higher before spending, binge eating, and risky sex than they were for NSSI. Again, it could be the case that there is a specific relationship between these behaviours and depressive feelings that needs to be explored further. None of the impulsive behaviours were associated with greater levels of sadness during the behaviour than NSSI, indicating that engaging in these other impulsive behaviours may have been more effective in distracting the individual from sadness in particular. This is not surprising given that the calming properties of NSSI sometimes do not replace the intensely negative feelings until immediately after the individual has ceased cutting (e.g., Brain et al., 1998a).

Finally, NSSI was associated with higher levels of sadness after engaging in the behaviour than was spending. This indicates that feeling sad may not be as common as other negative emotional states in the lead up to NSSI, but there is some sadness after one has engaged in self-cutting. This may be linked to previous research indicating that individuals feel remorseful or ashamed after engaging in NSSI (Brown et al., 2009).

General summary and conclusions

NSSI is frequently considered an impulsive behaviour, and it is apparent that NSSI and other impulsive behaviours such as binge eating, substance use and risky sex serve an affect regulation function. However, it appears that there is such a degree of variation in responding to these behaviours that a direct and meaningful comparison between NSSI and other impulsive behaviours is difficult. In Study 1 it was demonstrated that NSSI served a tension reduction purpose for individuals without BPD which is consistent with previous research (Brain et al., 1998a, 1998b; Haines, 1994). It was then speculated that these individuals may engage in other impulsive behaviours for the purposes of tension reduction, as it has been shown, for example, that binge eating is believed to reduce distress and frequently is associated with NSSI (Mitchell et al., 2008; Selekman, 2009; Stice & Agras, 1999).

In contrast, Study 1 demonstrated that for individuals with BPD, NSSI appears to serve a self-stimulatory purpose. It has been shown that other impulsive behaviours such as reckless sexual activity are associated with novelty seeking in BPD (Williams, 2006), hence it was speculated that individuals may demonstrate similar sensation seeking motivations associated with engaging in impulsive behaviours. The results in the current study were unable to provide much evidence to support these hypotheses as there were no major significant group differences in psychological, psychophysiological or motivational responses. What was consistent with BPD pathology was that these individuals were more likely than individuals without BPD to engage in binge eating and damage to property, and they were more likely to feel excited by engaging in risky sexual behaviours when compared with individuals without BPD.

It is recognised that the inclusion of a range of behaviours for the impulsive imagery script perhaps is likely to have created too much variability in responding. Hence, there were no meaningful results from the psychophysiological data. If it could be established that at least a single impulsive behaviour was most similar to NSSI in terms of function, then certainly future research may benefit from using a larger sample size and comparing NSSI with a single impulsive behaviour. However, from the results in the current study it was not apparent that there was an impulsive behaviour that very closely mirrored the affect regulation function of NSSI. Hence, the fact that the function of these impulsive behaviours did not share any similarities with NSSI could be seen as strongly indicating that NSSI is a unique behaviour. Its inclusion in the Impulse Control Disorders section of the DSM-IV-TR (APA, 2000) then seems unwarranted or unsupported. Other researchers also have argued that whereas NSSI may be considered impulsive, it may make more sense to conceptualise it in DSM-V as a separate behavioural disorder (Shaffer & Jacobson, 2009).

Similarly, these results provide further evidence that behaviours which can be considered impulsive are incredibly varied, and may be associated with different motivations and affect regulation functions at different times for different people. Hence, it is likely that whereas behaviours such as risky sex, binge eating and shoplifting share a commonality in the fact that they are impulsive, they are each unique behaviours and should be examined separately rather than making generalisations about their intent or affect regulation purpose.

There was some evidence of affect regulatory motivations associated with different impulsive behaviours. For example, excessive spending, binge eating and

reckless driving were associated with feelings of distress before engaging in the behaviour, and there was some indication that the intent behind engaging in the impulsive behaviour was to reduce or eliminate this distress. For other behaviours such as gambling and substance use, individuals did not associate these behaviours with any negative emotions, indicating that perhaps the primary function of these behaviours is sensation seeking (e.g., Coventry & Constable, 1999; Schmitz, 2005).

There was a significant main effect for *Depression* as a motivation for engaging in impulsive behaviours, which interestingly was not found when considering motivations for NSSI. When group scores on the MIBS were combined it also was apparent that the depression motive played a more important role for engaging in impulsive behaviours that *Extrapunitive*, *Operant*, *Modelling*, *Tension Reduction* and *Janus Face* motivations. When looking at the most commonly endorsed behaviours on the MIBS, 40.5% of participants completed the scale in relation to binge eating, and 35.7% chose substance use. Previous research has certainly associated depressive symptoms with binge eating (Burton et al., 2007; McElroy et al., 1995; Vollrath et al., 1992), and substance use problems (Allen & Hollander, 2006; Burton et al., 2007; Coleman, 1992; Miller et al., 1993). Interestingly, the research evidence has indicated that an intervention targeted at depressive symptoms reduced bulimic symptoms over a six-month follow up, although it did not reduce substance use. It was suggested that there is support for the affect regulation theory of bulimic pathology, but less for substance use disorders (Burton et al., 2007). Knowing that impulsive behaviours serve a different affect regulatory function to NSSI, future research might benefit from considering these behaviours separately.

As mentioned in Study 1, the BPD group consistently provided self-report ratings of their emotions at the time of NSSI that were de-synchronous with objective measures. That is, they stated that they felt calm, when the objective psychophysiological data indicated that this could not be the case as evidenced by increased heart rate. It seems apparent that perhaps there has been a relatively high degree of socially desirable responding that has occurred in the self-report questionnaire data from the MIBS I and II and the RIBS. This means that even when given the option of choosing positive emotions associated with NSSI (i.e., calm and excited), individuals were still not reporting in a way that is consistent with their psychophysiological responses in Study 1. Also puzzling, is the finding that in some instances, participants appeared to indicate that they felt calm and excited at the same time. Individuals with BPD may be more likely than those individuals without BPD to have external motivations (e.g., punishing others) for engaging in impulsive behaviours, due to their interpersonal difficulties (White Kress, 2003). In contrast to this prediction, there were no group differences on MIBS scores and neither group endorsed any external motivations. The only significant result was for depression as an internal motivating factor associated with engaging in impulsive behaviours. This again raises issues about the appropriateness and usefulness of relying on subjective measures, particularly when working with BPD populations.

In terms of differences in emotional responses before, during and after engaging in impulsive behaviours, self-report data from the RIBS again were quite varied. It was apparent that some behaviours, such as gambling and excessive spending, were associated with sensation seeking, as evidenced by the fact that participants were more likely to indicate that these behaviours were exciting rather

than distressing. For other behaviours such as reckless driving and substance use, it was apparent that individuals felt distressed or sad before engaging in the behaviour and calmer or excited after engaging in the behaviour. In this way, it is likely that some of these behaviours may provide similar tension reduction benefits in a similar way to NSSI. However, these results are largely exploratory in nature and do not provide a clear indication of how similar or dissimilar impulsive behaviours are to the affect regulation function of NSSI.

Certainly, there are a variety of other factors to consider when investigating individuals' motivations for engaging in impulsive behaviours, including NSSI. These may include symptoms (e.g., anxiety or depression), or cognitions about NSSI such as irrational beliefs, or distortions about one's perceived level of control over his/her own behaviour and emotions. The following chapters are dedicated to investigating some of these issues by returning more specifically to an examination of NSSI. Study 3 attempts to further draw out any meaningful differences that can be made between BPD and NBPD individuals in terms of their motivations for engaging in NSSI. It takes a closer look at internal as well as external factors associated with motivations for NSSI by considering additional symptomatology and potential issues surrounding comorbidity.

CHAPTER 8

Motivational, symptomatological and cognitive factors associated with NSSI in individuals with and without BPD

Motivations for NSSI

It is often the case that individuals may not always have complete insight into the reasons why they engage in NSSI. An explanation regarding motivation for engaging in NSSI may be biased in relation to a number of factors (Walsh & Rosen, 1988). For example, some individuals who are not suicidal may still cite suicidal motivations behind their behaviour in order to avoid a negative response from treating professionals (Favazza, 1996, 2011; Favazza & Conterio, 1989; Solomon & Farrand, 1996; van Moffaert, 1990; Walsh & Rosen, 1988). It also has been suggested that some individuals are simply unable to provide accurate information about their motivations for engaging in NSSI due to a lack of understanding of their own behaviour (Haines, Williams, & Brain, 1995; Walsh & Rosen, 1988).

However, delineating the motivational aspects of these behaviours is necessary in order to obtain a greater understanding of the ways in which better treatment options can be facilitated (Hjelmeland et al., 2002; Laye-Gindhu & Schonert-Reichel, 2005). Individuals may report many reasons for engaging in NSSI, including releasing tension, expressing anger toward the self and/or others, decreasing dissociative symptoms, self-medicating or self-soothing, communicating distress, manipulating the interpersonal environment, and relieving feelings of alienation, isolation, and anguish (Briere & Gil, 1998; Simeon & Favazza, 2001).

Osuch et al. (1999) outlined six motivational factors underlying NSSI: (1) affect regulation (e.g., to decrease anger or fear, to regain a sense of reality); (2) desolation (e.g., to keep bad memories away, to reduce feelings of emptiness); (3) punitive motivations (e.g., to punish oneself, or more rarely, to obey persecutory hallucinations); (4) influencing others (e.g., to express anger or show others how hurt

one is); (5) magical control (e.g., to protect important people, to prevent one from hurting others); and (6) self-stimulation (e.g., to provide excitement or a 'high').

In addition, Nock and Prinstein (2004, 2005) developed a functional model which suggests that NSSI serves four primary motivations that differ along two dichotomous dimensions: contingencies for NSSI that are automatic (i.e., within oneself) versus social (i.e., interpersonal), and reinforcement that is positive (i.e., followed by the presentation of a positive stimulus) versus negative (i.e., followed by the removal of an aversive stimulus). The four types of motivation are not necessarily exclusive and individuals may engage in NSSI for multiple reasons (Nock & Prinstein, 2004).

In general, it appears that the most parsimonious way to classify these motivational influences can be separated into internal and external factors. Other authors also have referred to these as intrapersonal and interpersonal factors (e.g., Guralnik & Simeon, 2001; Podvoll, 1969). Internal factors may refer to the range of affect regulation functions that NSSI serves. For example, the desire to alter one's emotional state, whether positive or negative, represents an internally driven process. In contrast, externally driven motivations are influenced by environmental factors such as the desire to change events, circumstances and the behaviour of other people. Yates (2004) suggested that whether or not NSSI is driven by internal or external motivations, the behaviour has the ability to carry the individual from one state to another, be it physical or psychological.

Traditionally, the research literature has emphasised the role of internal factors, however, researchers and clinicians are becoming increasingly aware of potential external motivations as well. One hypothesis which has been suggested is

that intrapersonal motivations are characteristic of NSSI in people without personality disorders, whereas interpersonal factors are more characteristic of individuals with personality disorder pathology, namely BPD.

There also are reported differences in the motivations for NSSI between males and females (Compas, Orosan, & Grant, 1993; McMahon, Grant, Compas, Thurm, & Ey, 2003). In general, it is speculated that males are more likely to report externalising and interpersonal reasons whereas females are more likely to cite internalising and intrapersonal motivations for the behaviour (Rodham et al., 2004; Laye-Gindhu & Schonert-Reichel, 2005).

Yates (2004) stressed that it is important to recognise that the 'motivations' of individuals who engage in NSSI, in fact, may represent post hoc behavioural attributions. That is, the individual may not identify a motivation before, during or even after the behaviour, but use the language of motivation to rationalise her/his behaviour. The following section will review the research literature on the motivations for NSSI that have been identified.

Internal motivations

The internal experiences of people who engage in NSSI suggest a need to regulate affect. Specifically, research has suggested that NSSI assists with the regulation of negative affect by expressing, replacing, reducing or distracting from anxiety, depression, racing thoughts, tension, anger, loneliness and dissociation, as well as feelings of guilt and emptiness that are common experiences for people who self-injure (Bennum, 1983; Bohus et al., 2000; Brown, Comtois, & Linehan, 2002; Chapman et al., 2005; Favazza & Conterio, 1989; Kemperman et al., 1997; Walsh &

Rosen, 1988). Some researchers have stated that NSSI also serves as a means of self-punishment, and of gaining control of and/or detaching from negative emotional experiences (Osuch et al., 1999; Rodham et al., 2004; Suyemoto, 1998). There also are a number of recurring themes in the literature such as the need for individuals who self-injure to 'escape' (Boegers, Spirito, & Donaldson, 1998; Rodham et al., 2004) overwhelming and intolerable emotions (Ross & Heath, 2003). Often, engaging in NSSI is described as a way of preventing suicide (Haas & Popp, 2006). In this way, NSSI can be viewed as a maladaptive coping strategy which is used to manage these symptoms of internal emotional distress (Haines & Williams, 2003; Kleindienst et al., 2008). NSSI also may be used to manage symptoms of Axis I disorders such as anxiety and mood disorders. Similarly, for individuals with an Axis II diagnosis, NSSI may be used as a maladaptive coping strategy for dealing with anger, feelings of emptiness or dissociation. The influence of Axis I and Axis II disorders will be discussed in detail in a subsequent section.

When asked to state reasons for engaging in self-injury, 25% of one sample stated that the behaviour provided a feeling of pleasure and relief, 20% stated that self-injury related to feelings of anger and 20% reported depression as a motivating factor for self-injury (Graff & Mallin, 1967). In another study, anger at oneself was endorsed as the main reason for engaging in self-injury, followed by tension relief, anger at others, and as a gesture of suicidal (Roy, 1978). Yet another study reported that 72% of individuals stated that self-injury helped to control racing thoughts, and 65% indicated that it helped them to relax (Favazza & Conterio, 1989).

Currently, the research literature has tended to focus on the assumption that NSSI reflects a desire to regulate negative emotions. The role of positive emotional

compensations in NSSI has seldom been researched, yet an adequate understanding of the process of affect regulation should include both increase and decrease across a range of emotional states, not just negative emotions (Gross, 1998a). Of course, the research also needs to take into account the role of secondary gain, and potential external motivations associated with NSSI.

External motivations

Self-injury may serve some external purpose by communicating distress to others, or eliciting change in the person's environment. Previous research has speculated that NSSI may represent an operant behaviour (Bostock & Williams, 1974; Henderson & Lance, 1979; O'Connor et al., 2000) in that the behaviour is reinforced by the resultant change in the behaviour of others towards the self-injuring individual. Other authors also have suggested that the response of others to self-injury can serve as a positive reinforcer for the behaviour (Favazza, 1989; Walsh & Rosen, 1988). Researchers also have noted that, in some instances, self-injury may be motivated by secondary gain (Grunebaum & Klerman, 1967; Shore, 1979). Therefore, even if the behaviour is not initially executed as a manipulative strategy, individuals who engage in the behaviour may quickly discover that there are rewarding interpersonal benefits associated with the act.

Nock and Prinstein (2004) suggested that the processes behind external motivations may reflect a social positive response (e.g., to get attention) or a negative response (e.g., to avoid punishment from others). Reports have indicated that NSSI has been used as a means of emotional blackmail (Favazza, 1989), and to elicit a caring response from others (Favazza, 1989; Feldman, 1988a), as well as a means for

making others feel guilty (Shore, 1979) and manipulating others into complying with their wishes (Feldman, 1988a). Other researchers have noted motivations such as indicating displeasure with others (Schwartz et al., 1989; Walsh & Rosen, 1988), and what has been termed 'retaliation self-mutilation' which is primarily noted in adolescents. For these individuals, self-injury was used as a method of 'getting even' following parental rejection or discipline (Schwartz et al., 1989).

Research has identified that operant motivations for self-injury generally are more apparent in forensic and psychiatric settings (Clendenin & Murphy, 1971; Cookson, 1977; Darche, 1990; Deiter, Nicholls, & Pearlman 2000; Gough & Hawkins, 2000; Haines, Williams, & Brain, 1995; Hillbrand, Young & Krystal, 1996; Langbehn & Pfohl, 1993). This is likely due to a contribution of limited problem solving skills in these populations, combined with highly controlled environments where individuals do not have a lot of autonomy. Indeed, researchers have suggested that some individuals come to recognise their self-injurious behaviour as an extremely effective social weapon (Walsh & Rosen, 1988).

Interestingly, it also is apparent that the role of interpersonal conflict has received more research attention in Western countries (e.g., Laloe, 2003; Pearson, Phillips, He, & Ji, 2002). Some researchers have explained NSSI as a method of controlling others, as it is a behaviour that others often cannot control which, in turn, gives the individual an illusionary sense of feeling more in control (Levitt, Sansone, & Cohn, 2004). Other researchers have suggested that engaging in NSSI can represent a misguided and dangerous, albeit effective way of seeking social support (Hilt et al., 2008). Other authors also have described NSSI as a morbid form of self-help (e.g., Favazza, 2006).

Other researchers have emphasised a social learning role in externally driven motivations, stating that self-injury, perhaps, is a behaviour that primarily is learnt in institutional settings. High rates of self-injury traditionally have been noted in settings where individuals spend a great deal of time in close contact with each other, such as hospitals and prisons (Graff & Mallin, 1967; Podvoll, 1969; Ross & McKay, 1979). In particular, there is now a large body of research evidence which is concerned with contagion effects of self-injury among adolescents in schools (e.g., Nock, 2009; Selekman, 2009; Stone, 1998; Taiminen et al., 1998; Walsh, 2006; Walsh & Rosen, 1988).

Walsh (2006) stated that many individuals who engage in self-injury in the context of groups feel that there is a 'special bond' among group members. Walsh further outlined the potential impacts of being exposed to others' injuries (e.g., seeing blood and lacerations) as reinforcing feelings of cravings to engage in the behaviour, feelings of competition (e.g., the need to create a more dramatic injury than one's peers) disinhibition (e.g., engaging in NSSI with others present), and cohesiveness (the need for others in the group to all be currently engaging in the behaviour).

Similarly, Walsh (2006, p.242) identified that there are unique contagion effects that arise via electronic communication such as text messaging, chat rooms, online forums and instant messenger programs. Influencing factors include operant motivations (e.g., "I can't believe you ignored my message! I ended up cutting myself"), coercion (e.g., "without the support from the members of the forum I would cut myself"), competition (e.g., "that's nothing, I just cut myself X times"), and modelling (e.g., "knowing that you cut yourself today means I may have to"). Walsh stated that there tends to be 'pecking orders' in chat rooms and the need to

demonstrate status by posting photographs of self-injuries on websites. Several websites claim to be aimed at support, however, in a similar way to pro eating disorder websites, it is possible that the content of these sites is triggering the behaviour rather than being therapeutic.

Contagion effects may be partly responsible for the high incidence of NSSI in schools, hospitals and prison settings. However, contagion cannot account for all cases of NSSI. For example, in one study researchers noted that there was a high number of participants who cut themselves before they entered hospital, which suggests that the behaviour is not simply a product of institutional life (Gardner & Gardner, 1975). Similarly, there is evidence to suggest that there are high prevalence rates of self-injury in prisoner populations. Given the influences of psychiatric illness and poor coping skills that many individuals experience prior to incarceration, NSSI frequently is used as a maladaptive coping strategy in this environment (e.g., Cookson, 1977; Dear et al., 2000; Haines, 1994; Haines, Williams, & Brain, 1995; Lanes, 2009; Lohner & Konrad, 2006).

The widespread media attention dedicated to self-injury means that individuals are likely to have an increased awareness of the behaviour nowadays than they did in previous decades. However, this does not necessarily mean that individuals will endorse modelling as their motivation for engaging in NSSI. One study stated that 91% of individuals who engaged in NSSI had neither previously known nor read about the behaviour prior to engaging in NSSI (Favazza & Conterio, 1989). Indeed, a study of prisoners who engaged in NSSI indicated that the majority of the sample reported modelling to be of little relevance as a motivation for engaging in the behaviour (Haines, 1994).

Despite the fact that external factors are believed to provide a good explanation for NSSI in certain settings or among certain populations (e.g., individuals with BPD), a review of the literature has indicated that operant processes only have a minor influence on NSSI (e.g., Hilt et al., 2008; Klonsky, 2007; Nock & Prinstein, 2004). However, one of the difficulties in the assessment of externally motivated behaviours is that individuals are likely to respond to self-report items in a socially desirable way. It certainly seems the case that internal motivational factors, such as affect regulation, are endorsed more frequently by individuals who engage in NSSI (Haines, Williams, Brain et al., 1995). It also appears that there may be sex differences in motivations for NSSI.

Sex differences in motivations for NSSI

Some of the early research on self-injury suggested that there may be important phenomenological differences in the motivations for the behaviour between males and females (e.g., Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Rosenthal et al., 1972). However, more recent research findings have been mixed in terms of support for the differences in motivations for NSSI between males and females.

One study indicated that males were more likely to engage in self-injury as a means of influencing others, and out of boredom (Laye-Gindhu et al., 2005), whereas females were more likely to engage in self-injury for relief of intropunitive factors such as self-hatred, depression, and loneliness (Laye-Gindhu et al., 2005). In another study it was reported that females who self-cut were more likely to say that they had done so because they wanted to punish themselves and because they wanted to get

relief from a 'terrible state of mind' (Rodham et al., 2004).

Another study indicated that there were no significant sex differences in the range and severity of symptoms associated with NSSI, however, females had a greater tendency to overreact to negative experiences than males and tended to have a heightened awareness of internal states. In addition, both males and females cited a need to reduce tension (Brain, 1998). In one large scale study of 633 adolescents, it was found that there were apparently no meaningful differences in motivation for NSSI between males and females (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007). Therefore, the research literature has been somewhat inconsistent in demonstrating sex differences in motivations for NSSI.

In summary, there a range of factors that have been reported to precede NSSI and research has suggested that relief from unpleasant feelings perhaps is the primary motivation for engaging in the behaviour. Hence, it is likely that affect regulation serves an important role in NSSI. In addition, there are certain cognitive and symptomatological factors which are likely to serve as motivating factors associated with NSSI. These may present as symptoms associated with specific disorders (e.g., Generalised Anxiety Disorder), whereas other are more akin to certain beliefs or cognitive appraisals which may be common to individuals who engage in NSSI, but are not necessarily attributable to a DSM-IV-TR (APA, 2000) diagnosis. The following section reviews some of these influencing factors, including issues to do with comorbidity.

NSSI and associated Axis-I symptomatology in individuals without BPD

NSSI does not feature strongly in DSM-IV-TR (APA, 2000) criteria of Axis I

disorders. Further, one study reported that approximately 12% of individuals who engaged in NSSI did not meet the diagnostic criteria for any disorder (Nock & Kessler, 2006). However, the presence of self-injury occurs concomitantly with a range of Axis I disorders such as mood disorders (O'Connor, Connery et al., 2000), dissociative disorders (Coons & Milstein, 1990; Shearer, 1994a, 1994b; Zlotnick et al., 1996), eating disorders (Favazza & Conterio, 1989; Paul et al., 2002; Shearer, 1994b; Simpson, 1975), anxiety disorders (Andover et al., 2005; van der Kolk & Fisler, 1995; Zlotnick et al., 1999), and SRDs (Shearer, 1994a; Simpson, 1995; van der kolk & Fisler, 1995; Zlotnick et al., 1999) Some researchers have indicated that 90% of individuals who engage in NSSI have at least one psychiatric disorder (Haw et al., 2001).

In addition, comorbidity is common (Suominen, Henriksson, Suokas, & Isometsä, 1996). This has important implications for research and treatment because NSSI is associated with a wide range of symptoms and associated motivational and cognitive factors. It is of note that virtually all DSM-IV-TR (APA, 2000) disorders are characterised by elevated levels of negative mood and/or distress (Watson, 2000). Therefore, emotional disturbance potentially influences every aspect of NSSI. Interestingly, one article (Andover et al., 2005) also indicated that psychiatric symptoms tend to vary depending on the method of NSSI used (i.e., cutting versus burning). The following section will outline the role of specific psychiatric symptoms which have been linked with NSSI.

Anxiety

Anxiety is one of the most common symptoms associated with NSSI

(Andover et al., 2005; Briere & Gil, 1988; Darche, 1990; Simeon et al., 1992; Stanley et al., 2001). In addition, there is evidence that escalating feelings of anxiety and tension are part of the phenomenology of NSSI (e.g., Andover et al., 2005; Bennum, 1983; Feldman, 1988a; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Klonsky & Olino, 2008; Mathews et al., 2003; Rosenthal et al., 1972; Simpson, 1975, 1976; Skegg, 2005).

As mentioned previously, research has suggested that anxiety plays a major function in NSSI, as evidenced by the tension reducing properties associated with the behaviour (Darche, 1990; Brain et al., 1998a, 1998b, 2002; Haines, Williams, & Brain, 1995; Haines, Williams, Brain et al., 1995; Herpertz, 1995). Studies also have shown increased levels of anxiety symptoms in individuals with a history of self-injury (Klonsky et al., 2003; Ross & Heath, 2002).

Posttraumatic Stress Disorder

In addition to reports of anxiety, in general, research attention also has been given to specific DSM-IV-TR (APA, 2000) anxiety disorders which tend to be associated with NSSI. For example, the literature has reported numerous cases of individuals who engage in NSSI who also would meet the diagnostic criteria for PTSD. The relationship between childhood trauma including neglect, physical and sexual abuse and NSSI has been frequently discussed (e.g., Briere & Gil, 1998; Connors, 1996a, 1996b; Favazza, 1999; Glassman et al., 2007; Nock & Kessler, 2006; Romans et al., 1995; Yates, 2004). From this research it seems clear that exposure to trauma seems to carry an associated risk for an individual engaging in NSSI.

In addition, several studies have demonstrated that there is a close relationship between dissociation, childhood sexual and physical abuse and long-term repetitive 'addictive' NSSI (Darche, 1990; Langbehn & Pfohl, 1993; Zlotnick et al., 1996). It has been suggested that childhood trauma causes dissociative tendencies and this is closely linked with using NSSI as a coping strategy (van der Kolk et al., 1991). It is clear that research and clinical practice needs to take the role of trauma into consideration when assessing motivational factors associated with NSSI. In addition to PTSD as a specific manifestation of anxiety, the research literature has also emphasised the role of Panic Disorder.

Panic Disorder with or without Agoraphobia

The specific role of NSSI in Panic Disorder and Agoraphobia has received very little research attention. It has been suggested that individuals with eating disorders who also engage in NSSI are likely to experience fears of loss of control and dying and, thus, have panic attacks (Hurvich & Simha-Alpern, 1997). Appleby (1994) also suggested that there is a great deal of risk that patients with severe panic disorder will engage in self-injury. However, this discussion did not refer specifically to NSSI. When the topic of NSSI and panic has been discussed, it is most often in the context of BPD. Therefore, the role of panic in NSSI will be discussed in a later section regarding comorbidity with BPD. Another anxiety disorder which has been linked to NSSI is OCD.

Obsessive-Compulsive Disorder

Obsessive-compulsive symptoms tend to be clinically unspecific and can be

found in numerous disorders (Brunnhuber, 2003). Several researchers have argued that some impulse control disorders share features with OCD. For example, Kleptomania, Pathological Gambling, and Trichotillomania, have been associated with OCD (McElroy, Phillips, & Keck, 1994). Researchers have also pointed to the co-occurrence of self-injuring and obsessive-compulsive behaviour (e.g., Lochner & Stein, 2010; Winchel & Stanley, 1991). However, the literature in this area can be confusing if the authors fail to distinguish between stereotypic, compulsive, major, and impulsive self-injury as outlined previously by Simeon and Favazza (2001). The issue is that individuals who have OCD who engage in compulsive behaviours may not have compulsive motivations for engaging in NSSI. That is, the behaviour may serve a more traditional affect regulation purpose which is related to their anxiety and not necessarily linked to other compulsive behaviours by means of neurochemical dysregulation.

True compulsive self-injury is rare (Favazza, 1996, 2011; Walter, 1991) and usually occurs as a result of a neurological condition. However, there is increasing evidence that compulsive NSSI is more common than previously thought. For example, one report indicated that up to 60% of individuals with Tourette's Disorder may engage in some form of NSSI (Mathews et al., 2003). As mentioned previously, the major function of NSSI appears to be related to tension reduction and affect regulation. However, for individuals with compulsive forms of NSSI, the purpose also may be related to neurochemical dysregulation (Herpertz, 1995; Haw et al., 2001; Mathews et al., 2003; Robertson et al., 1988). It is likely that the aetiology of NSSI in individuals with OCD is difficult to establish without appropriate investigative research.

The rituals associated with OCD serve to reduce anxiety and tension (APA, 2000). The most commonly reported outcome of NSSI is also tension reduction (Brain et al., 1998a, 1998b; Glenn & Klonsky, 2010; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Haines, Williams, & Brain, 1995; Lion & Conn, 1982; Rosenthal et al., 1972; Simpson, 1976; van Moffaert, 1990). Hence, it may be the case that for some individuals, NSSI reflects a destructive and compulsive ritual which is used to regulate affect.

It also is noteworthy that individuals who engage in NSSI without a diagnosis of OCD also may report a compulsion to engage in the behaviour (Favazza & Conterio, 1989), which may put into question the degree to which the behaviour is voluntary (van Moffaert, 1990). In terms of personality factors related to OCD, early research into self-injury demonstrated evidence that individuals who engage in NSSI may have perfectionistic and compulsive personalities (Graff & Mallin, 1967). These individuals tended to score higher than controls on measures of obsessionality, concerns with cleanliness, checking rituals, and irritability in response to disruption of routine (Gardner & Gardner, 1975; McKerracher et al., 1968).

Clearly, there may be an important link between a range of DSM-IV-TR (APA, 2000) anxiety disorders and NSSI. However, the research literature also has emphasised the role of symptoms associated with mood disorders, such as depressive symptoms. The following section will review some of this research.

Mood Disorders

Depression

Depression is perhaps the most common symptom associated with NSSI

(Andover et al., 2005; Bennum, 1983; Bennum & Phil, 1983; Briere & Gil, 1998; Darche, 1990; Graff & Mallin, 1967; Herpertz, 1995; Lambert & de Mann, 2007; McLaughlin et al., 1996; Muehlenkamp & Gutierrez, 2004; Rosenthal et al., 1972; Stanley et al., 2001). However, this disorder has received surprisingly little research attention in the context of NSSI (Muehlenkamp & Gutierrez, 2004). Rarely is NSSI reported in conjunction with a diagnosis of Major Depressive Disorder (van Moffaert, 1990), yet a large proportion of individuals who engage in NSSI suffer from depressive symptoms ranging from mild to severe (Lambert & de Mann, 2007). A review of the literature relating to NSSI within the context of affect regulation theory certainly suggests that a desire to remove, replace or distract from unwanted negative affect is a core motivating factor for the behaviour (e.g., Chapman & Dixon-Gordon, 2007).

It is important to distinguish NSSI from suicidal behaviour. However, it is the case that NSSI frequently is engaged in by individuals who may have contemplated or attempted suicide (Favazza, 1996, 2011; Klonsky & Olino, 2008; Laye-Gindhu & Schonert-Reichl, 2005; Muehlenkamp & Gutierrez, 2004; Zlotnick et al., 1997). Certainly, one of the risk factors for engaging in NSSI in individuals who are also depressed is that their thoughts can become dominated by suicidal thinking (Takeuchi et al., 1986). In addition, engaging in NSSI may desensitise the individual towards more lethal acts of self-injury, because the person may have habituated to feelings of fear and physical pain (Joiner, 2005).

Other researchers have found that depressive symptoms in NSSI may not be the best predictor of suicide (Mann, Waternaux, Haas, & Malone, 1999). Instead, it is likely that other factors interact with high levels of depression which contribute to

the risk of attempting suicide (Muehlenkamp & Gutierrez, 2004). Researchers such as Joiner (2005) have suggested that high levels of emotional distress in addition to high frequency of NSSI episodes may put the individual at risk for making a suicide attempt. The role of depression specific to NSSI requires further investigation. As more researchers make the important distinction between nonsuicidal, suicidal and parasuicidal forms of self-injury, current understanding of the relationship between depression and NSSI is likely to improve. To achieve this aim, the link between depression, mania and NSSI should be considered.

Bipolar Disorder

The research literature frequently has reported that individuals with BP are at an increased risk for engaging in NSSI (Dittmann et al., 2002; Fotiadou, Livaditis, Manou, Kaniotou, & Xenitidis, 2006; Jones & Tarrier, 2005). Yet, there have been surprisingly few studies dedicated to this topic outside of the context of BPD and, in general, research has tended to focus on the link between BP and suicidal behaviours.

Given the nature of the course of BP, it is perhaps likely that most individuals with the disorder engage in NSSI when they are feeling depressed. However, there is little information in the research literature documenting whether or not individuals are likely to engage in NSSI while in a manic phase of the disorder. As previously mentioned, there also is the need for the research literature to improve the distinction between BP and BPD in order to see what role NSSI may play in individuals who are diagnosed with BP. Of course, an understanding of the role of mood disorders in individuals who engage in NSSI also may be complicated by the additional influences of substance use.

Substance use

Several studies have reported an association between substance abuse and NSSI (e.g., Evans & Lacey, 1992; Gossop et al., 1975; Langbehn & Pfohl, 1993; Lion & Conn, 1982; Matsumoto & Imamura, 2008; Novotny, 1972; Rosenthal et al., 1972; Simpson, 1976; Zlotnick et al., 1999). Substance abuse and NSSI have common features in the sense that they are both used as coping strategies for unwanted emotions (Walsh, 2006). Drugs of choice among those who engage in NSSI include amphetamines (Harned, Najavits, & Weiss, 2006; Simpson, 1976), narcotics (Gossop et al., 1975; Harned et al., 2006), and cannabis (which has hallucinogenic, stimulant and depressant properties; Harned et al., 2006). Prevalence rates of individuals who engage in NSSI who use hallucinogens appear to be low (Harned et al., 2006), and there has been some suggestion that hallucinogens are highly anxiety provoking for individuals who engage in NSSI (Simpson, 1976).

It has been suggested that NSSI is more likely to occur when the individual is in an agitated state, rather than a sedated state, leading to more serious forms of self-injury (Gossop et al., 1975). Interestingly, one study indicated a higher incidence of self-injury in orally dependent drug users (32%) than in intravenous users (11%), with orally dependent users more likely to have engaged in multiple, repetitive episodes of self-injury (Gossop et al., 1975).

Alcohol often is implicated as the most commonly abused substance in individuals who engage in NSSI (Harned et al., 2006; Simpson, 1976), with patterns of periodic abuse rather than chronic alcohol dependence being more apparent (Favazza & Conterio, 1989). In terms of sex differences, there is evidence that males

are more likely to engage in NSSI while under the influence of alcohol (Kaplan & Fik, 1977), whereas females are more likely to report that they never do so (Favazza & Conterio, 1989). One study indicated that 60% of males consumed five or more units of alcohol prior to engaging in self-cutting, whereas most females who engaged in self-cutting were sober at the time (Maloney et al., 1987).

However, females still report problems with alcohol consumption. In a large sample of females who engaged in NSSI, 28% indicated they were concerned about their drinking habits, and 18% believed they could be classified as alcohol dependent (Favazza & Conterio, 1989). In other research, 30% of females who engaged in wrist-cutting reported alcohol abuse (Graff & Mallin, 1967), and 64% were identified as being alcohol dependent (Novotny, 1972). Furthermore, one study, which utilised a sample of 50 females from an alcohol abuse clinic, identified 23% of individuals who actually engaged in self-cutting, 27% who thought about doing so, 8% who engaged in self-burning and 15% who had thought of engaging in this behaviour (Evans & Lacey, 1992).

There has been limited research into the topic of NSSI and illicit drug use. However, some studies have suggested that individuals who engage in NSSI may be more easily addicted due to factors such as impulsivity (Gardner & Gardner, 1975; Graff & Mallin, 1967). Certainly, the link between NSSI and substance abuse has been consistently reported (Favazza & Conterio, 1989; Gossop et al., 1975; Graff & Mallin, 1967; Harned et al., 2006; Matsumoto & Imamura, 2008; Schwartz et al., 1989). It is likely that engaging in NSSI and substance abuse are linked by their shared impulsiveness. The most commonly reported reasons for engaging in NSSI for a drug dependent group in one study were poor impulse control, relief from

tension, the need to control one's environment, and a desire to control others (Schwartz et al., 1989).

It is important to consider the influence of substance abuse on individuals who engage in NSSI, as drugs play a significant role in the decision to act when impulsiveness is a factor (Bolognini, Plancherel, Laget, Stephan, & Halfon, 2003). In addition, individuals who engage in NSSI who use substances are a high risk group for attempting suicide (Hurry & Storey, 2000). However, reviews of interventions for self-injury do not focus on the treatment of substance abuse, so the question of whether assessment and treatment for substance abuse is effective at reducing or preventing NSSI remains open (Crome, Bloor & Frisher, 2008).

In addition to substance use, the research has frequently identified a link between NSSI and eating disorders. The following section will review some of the relevant literature on the role of eating disorders their affect regulation function,

Eating Disorders

The research literature has suggested that there is a strong link between self-injury and eating disorders (Cross, 1993; Favazza & Conterio, 1989; Graff & Mallin, 1967; Herpertz, 1995; Paul et al., 2002; Raine, 1982; Sansone & Levitt, 2002; Simspon, 1976; Walsh & Rosen, 1988; Winchel & Stanley, 1991). Some researchers have reported that up to 93% of individuals with eating disorders can be confirmed as engaging in self-injury, indicating that this is an important research consideration (Farber, 2008; Favaro et al., 2003; Favazza, 1996, 2011; Favazza, DeRosear, & Conterio, 1989). However, prevalence rates sometimes are difficult to interpret due to factors such as substantially different population sizes, failure to screen

participants for BPD, and differing definitions of eating disorders. Many of these studies also failed to make a distinction between differing levels of suicidality associated with self-injury, or between self-injury and self-poisoning.

One study which specifically examined NSSI in female inpatients with eating disorders reported a 35% lifetime rate of NSSI, excluding any participants with BPD (Paul et al., 2002). In terms of individual eating disorders, Bulimia is the most commonly reported eating disorder associated with NSSI (Favazza & Conterio, 1989; Fichter et al., 1994), although binge eating which is not accompanied with purging also is common (Simpson, 1976; Takeuchi et al., 1986). Anorexia also has been linked with NSSI, but as this disorder is associated with a high rate of suicide attempts (Farber, 2008; Favaro et al., 2003), the intent behind self-injury in individuals with AN may be inaccurately labelled as suicidal.

Rates of NSSI in individuals with eating disorders are not surprising given the similarities in the functions that NSSI and eating disturbances serve. Both NSSI and eating disorders tend to be impulsive, secretive and often ritualistic in nature (Strong, 1998). In addition, they also serve an affect regulation, self-medicating or tension reducing function (Farber, 2008; Strong, 1998). In addition, there are important biological reinforcers associated with eating disorders. For example, some researchers have suggested that opiates are released under conditions of starvation which promote an addiction to the starved state. Similarly, the process of vomiting may stimulate the production of opiates (Strong, 1998), which can result in an addictive, reinforcing response (Farber, 2008). The act of blood-letting during NSSI also may stimulate the release of endorphins and serotonin, which help to regulate both mood and eating behaviour (Parkin & Eagles, 1993). Interestingly, it has been

suggested that the onset of NSSI typically precedes the onset of the eating disorder (Favazza & Conterio, 1989).

Some authors have suggested that both NSSI and eating disorders can be interpreted as indicators of body dissatisfaction, feelings of ineffectiveness, and the need for self-punishment (Bolognini et al., 2003). There also are researchers who have suggested that eating disorders and self-injury are associated with a need to 'own' or control one's body and establish a sense of body versus self (e.g., Cross, 1993). Typically, the research has linked these issues to the experience of trauma, primarily childhood sexual abuse, and also to symptoms of dissociation (e.g., van der Kolk et al., 1991; van der Kolk & Fisler, 1995; Zlotnick et al., 1996).

For individuals who suffer from eating disorders and also engage in NSSI these behaviours may have external motivations, as they can be viewed as a method of controlling others. As mentioned previously, individuals may gain a sense of control of their own lives by engaging in behaviours that other people cannot control (e.g., self-starvation), in turn giving the individual an illusionary sense of feeling more in control (Levitt et al., 2004). Closely linked to the concept of feeling in control or out of control of one's emotions is the role of dissociation. The following section will outline that the ways in which individuals may use NSSI as a strategy to control dissociative symptoms.

Dissociation

Dissociative experiences are relatively common among individuals who engage in NSSI (e.g., Briere & Gil, 1998; Shearer, 1994a; van der Kolk et al., 1991; Zlotnick et al., 1999), although the severity and frequency of dissociative symptoms

rarely warrants a diagnosis of a dissociative disorder (APA, 2000). Dissociative experiences can range from mild perceptual distortions, daydreaming and lapses in concentration through to serious difficulties with the integration of thoughts, memories and a sense of identity (APA, 2000). Depersonalisation is identified by feelings of being numb, withdrawn and unreal (Bohus et al., 2000; Farber, 2008; Feldman, 1988a; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972; Simpson, 1975; Winchel & Stanley, 1991). During depersonalisation, the individual reports being aware of his/her own behaviour but it feels as if s/he is observing it from a distance.

For some individuals, NSSI typically occurs at a time when they are so distressed that they experience a state of dissociation or depersonalisation (Feldman, 1988a; Graff & Mallin, 1967; Simpson, 1975; van Moffaert, 1990; Winchel & Stanley, 1991). Reportedly, rates of dissociative experiences are so high among individuals who engage in NSSI that some researchers have suggested that it is an essential feature of the behaviour (e.g., Rosenthal et al., 1972). Furthermore, it has been reported that being in a depersonalised state is what allows individuals to engage in NSSI without feeling pain (van Moffaert, 1990). Painless self-injury may then serve to terminate unpleasant dissociative experiences (Simpson, 1975; Favazza, 1996; Suyemoto, 1998; Zlotnick et al., 1999).

The relationship between NSSI and dissociation is not completely understood. However, there are important differences which have been identified for different groups of individuals who engage in NSSI. For example, arm-cutting as opposed to wrist-cutting is more closely associated with dissociative phenomena (Matsumoto et al., 2004). Individuals who use both self-burning and self-cutting are

also more likely to dissociate than individuals who engage in self-burning only (Matsumoto et al., 2005).

However, it is apparent that not all individuals who engage in NSSI have the experiences of dissociation or depersonalisation (e.g., Gardner & Gardner, 1975). Alternatively, there may be two different types of NSSI, non-dissociative and dissociative. In a study of people who engaged in self-cutting, Levenkron (2006) suggested that those people who do not report dissociative experiences associated with cutting may be psychologically 'healthier' than those who do report dissociative experiences. However, Levenkron also suggested that dissociative symptoms may still emerge if self-cutting is used as a long-term coping mechanism. In this sense, the presence of dissociation may act as an indicator of the degree of distress and extent of NSSI along a continuum of severity of psychopathology.

In addition to the range of symptoms and disorders discussed thus far, the research literature also has identified other DSM-IV-TR (APA, 2000) diagnoses which may be associated with NSSI. For example, Dissociative Identity Disorder (DID), Body Dysmorphic Disorder (BDD), Gender Identity Disorder, and transexualism have received some research attention in the context of NSSI. However, given that these disorders tend to occur rarely, a detailed discussion of these issues is beyond the scope of this review.

Despite the wide range of possible symptoms and psychiatric disorders that have been associated with NSSI, the most consistently reported association is that of NSSI and BPD. The following section aims to identify the ways in which the presence of BPD may influence individuals' motivations for engaging in NSSI, and to specifically examine the importance of comorbid symptoms in this disorder.

The impact of BPD and comorbidity on motivations for NSSI

As mentioned previously, individuals with BPD have additional difficulties with interpersonal communication that are not experienced as intensely by people without BPD (Lieb et al., 2004). These difficulties should influence their motivation for engaging in behaviours that serve to regulate affect because the disturbance in affect may be caused by interpersonal difficulties. It is also likely that individuals with BPD will have other symptoms or diagnoses in addition to BPD which may influence their motivations for engaging in NSSI and other impulsive behaviours. More likely than not, individuals with BPD will experience a high degree of concomitant symptomatology (Skodol, 2011). Hence, it is imperative to give adequate attention to the potential influence of these other diagnoses.

Before embarking on a discussion about the much debated issue of comorbidity in BPD, an examination of the appropriateness of use of the term 'comorbid' seems warranted. The term 'comorbidity' usually implies that each co-occurring disorder diagnosed represents a distinct entity (Clarkin & Kendall, 1992; Lilienfeld, Waldman, & Israel, 1994). For BPD, this creates a problem in that symptoms of the disorder are heterogeneous and share a high degree of overlap with symptoms from other disorders. In fact, it is not uncommon for clinicians to use several Axis II diagnoses where there is sufficient overlap, or if they cannot settle on a single diagnosis of BPD (Skodol, 2011). Authors such as Paris (2008) and Skodol (2011) have preferred the term 'co-occurrence' because it implies the presence of two separate conditions rather than a blurring of overlapping symptoms. It also may assist in reducing the confusion that exists in the research literature reporting on the

overlapping symptoms between BPD and BP.

As mentioned previously, it has been suggested that it is clinically and psychometrically impossible to assess the complexity of BPD using only nine criteria (Shedler & Westen, 2004). With this in mind, traditional use of the term 'comorbid' with reference to BPD is possibly inappropriate because it is being applied to categories that years of empirical research has not been able to demonstrate convincingly as separate (Critchfield, Levy, Clarkin, & Kernberg, 2008). In light of the fact that BPD and other disorders may not truly be separate, some researchers have suggested that multiple disorders may reflect a single set of core symptoms or behaviours which demonstrate a 'consanguine' relationship (i.e., 'of the same lineage or origin', Critchfield et al., 2008; Tyrer, 1996). For example, there are similarities between symptoms of PTSD and MDD (e.g., sleeping difficulties) which could indicate that these disorders are not entirely separate (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). In a similar vein, others have suggested that there are intersecting dimensions of personality pathology which are so strongly related that they cannot have true separation at the phenotypic level (Depue & Lenzenweger, 2001).

The variation and range of symptoms that are characteristic of BPD mean that the disorder should be understood as polysymptomatic (Sansone, Levitt, & Sansone, 2005). There is a substantially high degree of comorbidity between BPD and other Axis I and Axis II disorders (Paris, 1999; 2003; Sansone et al., 2005; Zanarini et al., 1998; Zimmerman & Mattia, 1999). Despite these issues, research evidence has suggested that BPD can be viewed meaningfully as a distinct diagnostic construct (Johansen et al., 2004; Sanislow et al., 2002). Hence, this creates a paradox in the

sense that although BPD can be seen as representing a single entity, clinicians and researchers, nevertheless, are working with individuals who demonstrate a great deal of diversity in presenting symptoms and behaviours, despite sharing the same diagnosis.

Some researchers have estimated that approximately 90% of all individuals with BPD also share at least one other psychiatric diagnosis (Fryer, Frances, Sullivan, Hurt, & Clarkin, 1988), meaning that individuals with BPD have more co-occurring Axis I disorders than any other diagnostic group (Zimmerman & Mattia, 1999). These Axis I disorders are also more chronic and persistent in individuals with BPD than in those without BPD (Zanarini et al., 2004). It has been suggested that comorbidity may assist in distinguishing mild from more severe cases of BPD (Zanarini & Frankenburg, 2007). Zanarini and colleagues (2004) found that individuals with milder cases of BPD tend to demonstrate less comorbidity and, particularly, may be less likely to meet the diagnostic criteria for an anxiety disorder (Zanarini et al., 2004).

This can create some difficulty in determining which features of an individual's clinical presentation are specific to a BPD diagnosis and, in turn, lead to misdiagnosis (Kreisman & Straus, 2004). It also is important to recognise that the stigma associated with a BPD diagnosis may contribute to pressure for clinicians to avoid its use. Kriesman and Straus (2004) suggested that those clinicians whose practice is largely biological in orientation may be more comfortable using Axis I diagnoses which apply a treatment regime focused on medication than an Axis II diagnosis. Kreisman and Straus further stated that another significant contributor is the pressure to use short-term treatment for acute illnesses, as insurance typically

does not extend to more chronic Axis II disorders. This means that clinicians reporting diagnoses must cite an Axis I disorder in order to obtain full coverage.

It is important for both clinicians and researchers to be aware that comorbid psychiatric disorders in BPD are extremely common (Lieb et al. 2004). In fact, it is rare for individuals with BPD to be free from additional DSM-IV-TR (APA, 2000) diagnoses (Rosenthal et al., 2008). This creates a challenge in conducting research with individuals with BPD in that the assessor needs to internal and external validity in any inclusion or exclusion of symptoms. Although some researchers have tried to improve internal validity by eliminating potentially confounding effects of medication, current drug and alcohol use and other diagnoses such as other personality disorders and Schizophrenia (e.g., Herpertz et al., 1999; Rüsch et al., 2008), this would likely reduce the external validity or real world applicability because individuals with BPD who are free from these other difficulties are rare (Rosenthal et al., 2008; Schmahl & Bremner 2006).

One longitudinal study reported that over 50% of individuals with BPD (N = 290) were taking two or more medications, over 35% taking three or more, 20% taking four or more, and more than 10% taking five or more concurrent standing medications (Zanarini et al., 2004). The majority of these medications were antidepressants (67%), anxiolytics (28%), antipsychotics (27%) and mood stabilisers (22%). Clearly, the use of medication is an important issue in the validity of research. Certain medications such as antidepressants, anticholinergics, beta adrenergic blocking agents and neuroleptics are known to confound results from neuroimaging and psychophysiological studies (Herpertz et al., 1999; Rosenthal et al., 2008), because they reduce sympathetic nervous system activity.

However, the use of psychotropic mediations clearly is common among patients with BPD (Lieb et al., 2004). In fact, psychotropic medication use among individuals with BPD is reportedly 80%–90% (Zanarini, Frankenburg et al., 2001) with approximately 70% reporting sustained use across many years (e.g., Zanarini et al., 2004). Thus, to exclude individuals who are taking medication from research may create a bias in results and be of little assistance to a real-world application of research findings. Further to this point, Rosenthal et al. (2008) pointed out that it is more problematic when researchers use a BPD group with comorbid Axis I diagnoses and a control group with no Axis I or II pathology. This creates the possibility that the differences observed between the BPD and control groups are not the result of BPD related differences but of psychopathology in general and/or the presence of Axis I disorders. With these issues in mind, it seems important to fully explore the range of additional Axis I and Axis II psychopathology that is known to affect individuals with BPD.

BPD and comorbid Axis I disorders

Anxiety and anxiety-related disorders

Anxiety plays an important role in BPD, and research has suggested that individuals with BPD who have comorbid anxiety disorders are at risk for poorer treatment outcomes as the additional anxiety further impedes their psychological adjustment (Zanarini et al., 2004). Biological findings have noted the role of the left amygdala in trait anxiety, which is an important symptom of BPD (Rüsch et al., 2003; Tebartz van Elst et al., 2007). However, prevalence rates of individuals experiencing comorbid anxiety are variable. One study reported that only 7% of

individuals with BPD met the diagnostic criteria for an additional anxiety disorder (Pope, 1983), whereas another longitudinal study found that 60% of individuals met the diagnostic criteria for an anxiety disorder (Zanarini et al., 2004).

It has been suggested that the role of anxiety and subsequent comorbid anxiety disorders in BPD has been underestimated (Zanarini et al., 1998). It is certainly possible to deduce that any one of the nine symptoms of BPD could be related to anxiety. Fears of abandonment, interpersonal difficulties, feelings of emptiness, identity disturbance and impulsive behaviours all may have a close relationship with anxiety. Similarly, symptoms of anxiety may serve as a trigger for anger outbursts, mild psychosis and dissociative symptoms.

Researchers such as Gunderson and Links (2008) have suggested that anxiety in BPD is "extremely common" (p. 167) and often is a trigger for the individual to engage in impulsive, self-destructive behaviours. These authors further emphasised the importance of two specific sources of anxiety, somatic anxiety and psychic anxiety. Somatic anxiety is experienced through the body by way of sensation seeking behaviour, and physical sensations associated with panic. The authors also suggested that it is associated with antisocial behaviour and a histrionic cognitive style. Psychic anxiety is experienced via obsessional, avoidant and phobic symptomatology. The authors suggested that individuals who experience this type of anxiety have low tolerance for stimulation and a negative bias in cognitive style which is associated with high expectations of danger and harm. Typically, these individuals also have an extensive history of abuse.

Clearly, treatment of comorbid anxiety disorders in BPD needs to be a priority (e.g., Links, Heslegrave, Villella, & Silk, 1998). The following section

details some of the anxiety disorders which are most commonly comorbid with BPD.

Obsessive-Compulsive Disorder

As mentioned previously, researchers have identified a possible link between impulsive behaviours and OCD (e.g., Hollander, 1999; Paris, 1992; Rasmussen & Tsuang, 1986). Early conceptualisations of BPD refer to obsessive-compulsive symptoms of neurosis and anancastia (an obsession in which the individual feels forced to act or think against his/her will) (Brunnhuber, 2003).

A number of studies have suggested evidence of comorbidity with OCD and NSSI, particularly in groups with more severe psychopathology such as BPD. For example, using a sample of individuals with BPD, one study compared symptomatology experienced by individuals who did and did not engage in NSSI. The results indicated that the group who engaged in self-injury had more obsessive-compulsive symptoms than individuals with BPD who did not engage in self-injury (McKay, Kulchycky, & Danyko, 2000). In the context of affect regulation theory, it was suggested that self-injury in borderline patients may be a diathesis for OCD symptoms when episodes of self-injury are in remission.

Another study also found that OCD symptoms were significantly more severe in patients with an intention to engage in self-injury (Davis & Karvinen, 2002). A further study by Hayashi (1996) outlined three case reports of patients with BPD and OCD spanning across 10 years, which were used to demonstrate a relationship between the two disorders. Features identified in these patients included pervasive symptomatic overlap of obsessive-compulsive symptoms, poor insight and evidence of obsessive control evident in personal relationships. The author suggested that the

comorbid relationship between BPD and OCD is complex, however, it seems that OCD pathology is linked with rather than being independent from BPD pathology.

However, there are limitations to these studies, particularly with regard to the issue of additional comorbidity. It is of note that some of the participant groups used included individuals who also met the diagnostic criteria for an eating disorder (e.g., Davis & Karvinen, 2002). Research previously has indicated a link between eating disorders (particularly AN) and obsessive-compulsive symptoms (Crane, Roberts & Treasure, 2007; Drummond et al., 2008; Sherman et al., 2006; Strober, Freeman, Lampert, & Diamond, 2007; Swinbourne & Touyz, 2007; Wu, 2008). A potential relationship between these disorders is something which requires further investigation. In addition to OCD, the research literature has identified an important potential relationship between BPD and the specific influences of trauma on anxiety symptoms.

Posttraumatic Stress Disorder

The relationship between BPD and PTSD is complex, although it has been studied extensively. As mentioned previously, several researchers take the view that the development of BPD is strongly correlated with the presence of childhood trauma and abuse (e.g., Bleiberg, 1994; Brown & Anderson, 1991; Bryer et al., 1987; Herman et al., 1989; Ogata et al., 1990; Silk et al., 1995; Zanarini & Frankenburg, 1997). Herman and van der Kolk (1987) suggested that BPD can be conceptualised as a chronic form of PTSD, which has lead other researchers to argue that BPD is actually a trauma spectrum disorder, which is closely related to dissociative disorders. Certainly, rates of comorbid PTSD in this group are high, with 56% of

individuals with BPD also experiencing comorbid PTSD and 68% of individuals with PTSD also receiving a diagnosis of BPD (Shea et al., 1999).

Evidence has suggested that the severity of trauma and the age at which it occurred is likely to influence factors such as the nature of self-destructive behaviours in which these individuals engage (van der Kolk et al., 1991). The influence of childhood trauma in BPD is important because the experience of neglect and abuse may impair the individual's capacity for affect regulation and interpersonal relationships (Field, 1985; van der Kolk, 1987; van der Kolk et al., 1991).

There is a school of thought that suggests that engaging in NSSI represents a 're-enactment' of previous trauma (e.g., Leibenluft, Gardner & Cowdry, 1987; Miller, 2005; Power & Dalgleish, 1997) which is carried out in an attempt to control a previously unmanageable situation or to provide a means of coping with intrusive memories (Connors, 1996a, 1996b). Some researchers have believed that the individual can use NSSI to try and master a traumatic experience by turning the passive experience of being a victim into something that can be actively controlled by the individual (Conterio et al., 1998).

In addition, the nature of BPD symptoms such as impulsivity and interpersonal difficulties means that, as adults, these individuals may be more likely to put themselves in high-risk situations in which they are easily hurt or exploited. Individuals with BPD often experience a greater number of stressful or traumatic life events (Wingenfeld et al., 2009) because their lives as children are frequently dominated by chaos (van der Kolk et al., 1991). This, in turn, sometimes results in a tendency for individuals with BPD to create chaos in their adult lives (Abela, Payne, & Moussaly, 2003). This is not to say that individuals with BPD are necessarily

responsible for the trauma, but that they are more vulnerable to experiencing traumatic events.

Despite the finding that trauma is a commonly shared experience in individuals with BPD, it should be noted that meta analyses often have indicated that the relationship between childhood trauma and BPD symptoms is weak (e.g., Fossati et al., 1999; Paris, 2003). It is also important to note that BPD patients with and without PTSD often have very similar life experiences, including traumatic ones (Wingenfeld et al., 2009). Hence, it needs to be kept in mind that the experience of trauma does not necessarily mean that the individual with BPD will also have comorbid PTSD. Research evidence also has suggested that there are 'nontraumatic' pathways to BPD (Graybar & Boutilier, 2002, Paris, 2007; Paris & Zweig-Frank, 1992) so it is unwise to view childhood adversity as the sole cause of BPD (Zanarini & Frankenburg, 2007). Closely related to the experiences of trauma and anxiety, is the specific role of panic. The following section will outline some of the research evidence in relation to BPD and Panic Disorder.

Panic Disorder

The co-occurrence of Panic Disorder and BPD is estimated at 29% (Zanarini et al., 2004). Other researchers have suggested that Cluster B disorders are likely to be comorbid with Panic Disorder (Diaferia et al., 1993; Modestin, Oberson, & Erni, 1997; Renneberg, Chambless & Gracely, 1992). The presence of personality disorder is likely to affect the course of panic disorder because these individuals often experience more severe levels of anxiety, depression and Agoraphobia (Latas, Starcevic, Trajkovic, & Bogojevic, 2000; Ozkan & Altindag, 2005). One study

indicated that males with Panic Disorder were more likely to meet the diagnostic criteria for BPD, whereas females were more likely to meet the diagnostic criteria for Histrionic or Cluster C personality disorders (Barzega, Maina, Venturello, & Bogetto, 2001). There also is evidence that individuals with BPD who have experienced sexual abuse are more likely to demonstrate early onset of panic disorder (Ozkan & Altindag, 2005).

A study by Friedman and Chernen (1994) indicated that individuals with BPD who also suffered from panic and Agoraphobia tended to have greater affective instability, greater duration of panic attacks, more cognitive distortions during panic attacks, higher levels of anger and suicidality. In addition, these individuals were more likely to experience more severe and chronic family and work problems, substance abuse problems and more visits to hospital emergency departments. Clearly, there is evidence that the presence of Panic Disorder (particularly with the addition of Agoraphobia) is likely to exacerbate symptoms of BPD. This is something which warrants further attention in the research literature.

In addition to the role of anxiety in BPD, the research literature also has suggested that additional symptoms of mood disorders may need to be taken into consideration. Specifically, it has been suggested that DSM-V will aim to emphasise the importance of depressive symptoms in BPD (Skodol, 2011). Therefore, the following section will examine the research evidence on the role of mood disorders in BPD.

Mood Disorders

Major Depression

Approximately 61-87% of individuals with BPD also would meet the diagnostic criteria for MDD (Linehan et al., 2006; Zanarini et al., 2004; Zimmerman & Mattia, 1999). It has been suggested that individuals with BPD have a unique experience of depression (Stanley & Wilson, 2006) that distinguishes them from individuals without personality disorder, regardless of whether they have MDD or BP (Wilson et al., 2007). Notably, individuals with BPD seem to experience a more severe subjective experience of symptoms (Abela et al., 2003). It has been suggested that individuals with BPD are influenced by cognitive factors which make them more vulnerable to experiencing depression, and to experiencing this greater severity of symptoms. These cognitive vulnerabilities can include factors such as low self-esteem, hopelessness, a high level of rumination and general dysfunctional attitudes about stress (Abela et al., 2003).

Using the cognitive diathesis-stress model, theories have posited that following the occurrence of negative events, individuals with BPD are more likely to develop symptoms of depression than those individuals who do not have these cognitive vulnerabilities (Abela et al., 2003; Abela, Skitch, Auerbach, & Adams, 2005). It also is possible that individuals with BPD and comorbid depression experience greater stress because they actually create increased chaos and stress in their lives as evidenced by relationship instability and impulsive behaviours (Abela et al., 2003). This finding also is reflected in the fact that MDD without comorbid Axis II diagnoses has a 70%-80% treatment success rate. However, when accompanied by BPD, the success rate is halved (Kreisman & Straus, 2004).

Depression plays an important role in the symptomatology of BPD, and this is something that needs to be taken into consideration both in research and in clinical practice. However, it may be of equal importance to examine the role of manic symptoms in BPD, and to consider the ways in which these symptoms might be meaningfully differentiated from DSM-IV-TR (APA, 2000) criterion 6 for BPD (affective instability due to a marked reactivity of mood).

Bipolar Disorder

Within the current DSM-IV-TR (APA, 2000), BPD and BP share several traits including impulsivity, anger and mood swings. Rates of individuals with BPD who also have comorbid BP are estimated at 7%-20% (Benvenuti et al., 2005; Zanarini et al., 2004). Specifically, research has identified that there may be some relationship between Bipolar II Disorder and BPD due to the overlap in symptoms and the relationship between BPD and BP found in family studies (e.g., Magill, 2004). However, this relationship remains unclear as other researchers have come to opposite conclusions (Benazzi, 2008).

Some researchers have even suggested that BPD should be included as part of the Bipolar spectrum (e.g., Ghaemi, Ko, & Goodwin, 2002). This appears to be based on the misclassification of the mood shifts in BPD as being similar to the 'ultra-rapid cycling' mood swings of BP (Paris, 2007). Paris (2008) stated that a problem exists whereby psychiatrists are refusing to acknowledge the presence of BPD and, instead, refer to these patients as 'bipolar'. Other researchers have suggested that family studies of individuals with BPD and BP indicate that bipolar illness is rare in first-degree relatives, but that impulsive disorders (e.g., substance abuse and ASPD) are

common (Paris, 2007; White et al., 2003). Some researchers simply have stated there is no evidence that BPD and BP share a common aetiology (Paris, 2004). In a review of the research conducted in this area, Paris and colleagues (2007) concluded that BPD and BP can co-occur but that this relationship is not consistent and that there are important differences to be noted both in phenomenology and in medication response.

In attempting to delineate BPD and BP characteristics, Kreisman and Straus (2004) identified that mood fluctuations in BP are often unrelated to environmental circumstances, whereas mood swings in individuals with BPD are "almost always" (p.126) related to external events. Individuals who are experiencing a manic episode tend to be less aware of or responsive towards others, particularly when grandiose, whereas individuals with BPD may be more reactive in their behaviour towards others, demonstrating fears of rejections and a negative self-image (Kreisman & Straus, 2004). In addition, the authors noted that in between mood swings, individuals with BP function well, whereas individuals with BPD experience prolonged distress from symptoms. However, perhaps it is unwise to oversimplify this distinction because some individuals with BPD can certainly experience less severe symptoms and can function adaptively within the community (Paris, 2008).

Paris et al. (2004) suggested that it is unusual for BPD to evolve into BP. However, it is common for individuals who actually suffer from BPD to be given a diagnosis of BP in order to avoid stigma or due to "sloppy diagnostics" (Kreisman & Straus, 2004, p. 125). Generally speaking, BPD is associated with a higher overall level of impulsiveness than Bipolar II (Wilson et al., 2007) and some have suggested that impulsiveness distinguishes individuals with BPD from individuals with Bipolar

II (e.g., Benazzi, 2006). However, it also has been suggested that different facets of impulsiveness are associated with each disorder (Wilson et al., 2007). This is something which requires further investigation, as there are few studies which have specifically examined the role of impulsive behaviours in these two disorders. Closely related to BP and impulsivity is the potential role of substance use on mood in BPD.

Substance use

Problems with substance use frequently are identified in individuals with BPD (Bornovalova, Lejuez, Daughters, Rosenthal, & Lynch, 2005; Bornovalova, Gratz, Delany-Brumsey, Paulson, & Lejuez, 2006; Bornovalova et al., 2008; Feske et al., 2006; McMain et al., 2007; Zlotnick et al., 2008). Although a small number of studies have been unable to confirm a relationship between substance use, NSSI and BPD (e.g., Soloff, Lis, Kelly, Cornelius, & Ulrich, 1994; Dulit, Fryer, Leon, Brodsky, & Frances, 1994), the overwhelming majority of the evidence has suggested that problems with substance use are an important contributing factor in affect dysregulation.

Research has indicated that approximately half of all individuals with BPD experience co-occurring alcohol or substance abuse at a level which would warrant an additional diagnosis (e.g., Linehan et al., 2006; Zanarini et al., 1998, 2004; Zimmerman & Mattia, 1999). In particular, women who are psychiatric patients seem to be particularly vulnerable to comorbid BPD and substance abuse (e.g., Darke, Williamson, Ross, Teesson, & Lynskey, 2004; Zanarini et al., 1998), even when the effects of other personality disorders are controlled for (Feske et al., 2006).

Comorbid BPD and SRDs are associated with increased risk for a number of adverse and potentially lethal outcomes for afflicted individuals. For example, individuals with BPD who also have SRDs are more likely to participate in the sex trade industry and have a high number of sexual partners. As mentioned previously, the link between BPD, SRDs and risky sexual activity appears to be quite strong, although this issue has received surprisingly little research attention (Feske et al., 2006). In addition, individuals with comorbid BPD and SRDs are more likely to engage in needle sharing and more frequent and severe drug overdoses and suicide attempts (Feske et al., 2006).

Research has suggested that the reasons for the high rate of comorbid SRDs in BPD can be explained by the presence of affective instability and impulsivity (Feske et al., 2006; Trull, Sher, Minks-Brown, Durbin, & Burr, 2000). In addition, BPD and SRD have similar familial precursors such as family history of SRD, ASPD and childhood abuse and neglect (Paris, 2000; Zanarini & Frankenburg, 1997). Similarly, the neurobiological correlates of BPD (e.g., dysfunction in the prefrontal cortex) also have been implicated in the aetiology of SRD (Feske et al., 2006; Monarch, Saykin, & Flashman, 2004). Interestingly, one study reported that the absence of SRD was a strong predictor of remission from BPD rather than the absence of any other type of disorder. This, perhaps, implies that comorbid mood disorders and PTSD are not the strongest influence over the course of BPD symptoms as much of the current research has suggested (Zanarini et al., 2004). Given the likelihood that a vast majority of individuals with BPD will have comorbid SRD, it seems even more important to include affect regulation skills training in treatment with a focus towards targeting substance use (Feske et al., 2006; Linehan,

1993; Zanarini et al., 2004). Of course, individuals with BPD may not only experience difficulties with use or consumption of substances. In addition to substance use, individuals with BPD may also experience symptoms of eating disorders, which may warrant an additional diagnosis.

Eating Disorders

As mentioned previously, BPD is a poly-symptomatic disorder. As a result, the presence of a range of Axis I diagnoses has the potential to distract the clinician from exploring an additional diagnosis of BPD, particularly if the Axis I disorder is a life-threatening eating disorder (Sansone & Levitt, 2002). Individuals with BPD often manifest symptoms of disordered eating as well as comorbid eating disorders (Dulit et al., 1994; Gunderson, 2001; Marino & Zanarini, 2001; Paul et al., 2002; Sansone et al., 2005; Zanarini et al., 1989, 1998). Indeed, some researchers have referred specifically to a subtype of individuals with BPD and eating disorders (EDBPD) (Levitt, 2005), stating that this presentation requires specific attention.

Prevalence rates of individuals who could be classified as EDBPD are not completely known. One study reported a rate of 34% for comorbid eating disorders in individuals with BPD (Zanarini et al., 2004). In terms of prevalence rates for individual eating disorders, Zanarini and colleagues' 1998 study, using a combined gender sample of inpatients with BPD and Axis II controls, found that 21% of individuals met the diagnostic criteria for AN, 26% for BN, and 26% for Eating Disorder Not Otherwise Specified (EDNOS). More recently, a review of studies in the area by Sansone and colleagues (2005) found BPD prevalence rates of 10% in AN restricting type, 25% in AN Binge-Eating/Purging Type, and 28% in BN. The

prevalence of BPD in those individuals with BED is estimated at 12% (Sansone et al., 2005). It is apparent that individuals who have BPD and concomitant eating disorders are particularly difficult to treat (Linehan, 1993).

AN restricting type may be less common in BPD than other eating disorders because it tends to be less associated with other impulsive behaviours (Favaro et al., 2003). A number of studies also have compared AN and BPD samples with a control group (e.g., Laporte & Guttman, 2001; Stein, 1996), which would imply that these two disorders are perhaps less likely to be comorbid. However, other researchers have suggested that despite the seeming differences, the affected areas of functioning in eating disorders such as AN may be quite similar to BPD. For example, it has been stated that the role of impaired affective functioning in eating disorders may be understated in the DSM-IV-TR (APA, 2000; Sansone & Levitt, 2005). Furthermore, Garner and Garfinkel (1997) highlighted the fact that starvation predisposes an individual towards affective instability (e.g., moodiness, irritability and anger outbursts). Goodsitt (1997) also described how individuals with AN lack adequate self-soothing and affect regulation skills, and how they often feel "restlessly bored, empty, and aimless" (p. 209). This description is strikingly similar to that of accounts of BPD.

Bulimia Nervosa is perhaps the most widely researched eating disorder in the context of BPD. However, one of the problems with research in this area is that researchers have failed to use a well-defined assessment of BPD (Marino & Zanarini, 2000). Hence, findings regarding the potential differences between individuals who have BN and BPD and those who only have BN are mixed. Some researchers have suggested that there are no significant differences in bingeing or purging behaviour

between individuals with and without BPD, but individuals with BPD are more likely to report feelings of ineffectiveness and poorer interoceptive awareness (Zeeck et al., 2007). Other studies have demonstrated that individuals with BN and BPD have significantly impaired executive function compared to individuals with BN without BPD (Bourke et al., 2006).

A study by Marino and Zanarini (2000) indicated that EDNOS may be the most common eating disorder diagnosis among individuals who have BPD. The authors further stated that 75% of women with diagnoses of BPD and EDNOS have never met the diagnostic criteria for AN or BN. This suggests a cluster of disordered eating symptoms that may be unique to BPD. In addition, the authors found that one particular subtype of EDNOS, purging without binge eating, is pathognomonic for borderline women. The authors speculated that this pattern of behaviour may represent a form of self-injury or self-punishment. It appears that there is an important relationship between BPD, eating disorders and NSSI, however, this relationship is still not fully understood.

Other Axis I symptomatology

As identified previously, the list of possible Axis I disorders which could be comorbid or confused with BPD is extensive. Although a thorough review of all possible symptom combinations is beyond the scope of this review, there are some additional diagnoses and/or symptoms which warrant further discussion.

Dissociative experiences are being increasingly recognised as an important component of BPD (Brodsky et al., 1995). The DSM-IV-TR (APA, 2000) has recognised this by the inclusion of criterion 9 (stress-related paranoid ideation and

dissociation). Furthermore, experiences of dissociation appear to be more common in those individuals with BPD who engage in NSSI than in those individuals with BPD who do not (Brodsky et al., 1995; Shearer, 1994a). Certainly, not all individuals who engage in NSSI with BPD experience dissociation (Shearer, 1994b; Zweig-Frank et al., 1994). However, it is worth considering that for some individuals with BPD, dissociative experiences may have a relationship with feelings of emptiness (criterion 7) and identity disturbance (criterion 3).

In addition, recent research has found that ADHD is common in individuals with BPD (e.g., Davids & Gastpar, 2005; Lampe et al., 2007; Philipsen, 2006). Clinical observations have indicated that both disorders share key features such as emotional instability, impulsivity, substance abuse, low self esteem and problems with interpersonal relationships (Davids & Gastpar 2005). It has been suggested that as many as 60% of adults with BPD have a lifetime history of ADHD (Fossati, Novella, Donati, Donini, & Maffei, 2002), suggesting that children with ADHD may be at risk of developing BPD as adults (Philipsen et al., 2008). Prevalence rates for ADHD in children range from 3-12% (Biederman & Faraone, 2005; Faraone et al., 2000). The prevalence of ADHD in adults is reportedly 1-4% (Faraone, Biederman, & Mick, 2006). The reasons as to why ADHD in childhood may be a risk factor for BPD remain unclear. However, there is support for a genetic and neurobiological origin which largely is associated with the central dopaminergic and noradrenegric systems (e.g., Wilens, 2006).

In addition to the range of symptomatology associated with BPD which has been discussed thus far, it is also important to consider the potential contributing factors of other personality disorders. It is likely that BPD will continue to share

extensive comorbidity with other personality disorders (Critchfield et al., 2008; Zanarini et al., 1998), hence an examination of potential additional personality pathology in BPD seems warranted.

Other Axis-II symptomatology

Research has indicated that BPD is most likely to share similarities with other Cluster B diagnoses (Becker, Grilo, Edell, & McGlashan, 2000; Stuart et al., 1998). Other studies have examined the prevalence rates of comorbidity with Clusters A and C and found mixed evidence. For example, one study using an out-patient population found that BPD was associated with Avoidant, Paranoid, and Dependent personality disorders more so than other Cluster B disorders (Conklin & Westen, 2005). However, an examination of the diagnostic criteria would indicate that after Cluster B diagnoses, Dependent and Schizotypal personality disorders share more similarity with symptoms of BPD than any of the other Cluster A and C diagnoses (Stuart et al., 1998).

There also are noticeable gender differences observed in the comorbidity of BPD and other personality disorders. For males, BPD is more likely to be comorbid with Paranoid, Passive–aggressive, Narcissistic, Sadistic, and Antisocial personality disorders (Zanarini et al., 1998). Findings from Axis II assessment of Spanish-speaking out-patients with SRDs (Grilo, Anez, & McGlashan, 2002) also demonstrated a greater co-occurrence of BPD with Antisocial, Avoidant, and Depressive personality disorders for men, but not for women. For women diagnosed with BPD, an additional diagnosis of HPD is common (Blagov & Westen, 2008; Wilkinson-Ryan & Westen, 2000).

The role of NSSI in other personality disorders such as Passive-aggressive, Schizoid, Avoidant (Haines, Williams, & Brain, 1995) and Antisocial (Zlotnick et al., 1999) also have been reported. This may indicate that for some individuals with BPD, their affect regulation difficulties could be complicated by additional personality patterns. The following discussion focuses on those Axis II disorders which have been more frequently identified as potential comorbid diagnoses associated with BPD.

Cluster B

Antisocial Personality disorder

ASPD, perhaps, is the most commonly reported Axis II disorder comorbid with BPD. ASPD and BPD share many similarities with regard to their phenomenology, underlying temperamental traits, familial risk factors, and symptom course (Feske et al., 2006), although the gender distribution for each disorder is skewed. It is of note that approximately 75% of individuals with BPD are female and 75% of individuals diagnosed with ASPD are male. Interestingly, an estimated 25% of individuals with either diagnosis will meet the diagnostic criteria for the other (Zanarini & Gunderson, 1997). This has prompted researchers to hypothesise that BPD and ASPD are 'mirror disorders' with similar underlying traits that lead to different behavioural manifestations according to the gender of the individual (Paris, 1997). In one large scale study investigating comorbidity of DSM-III personality disorders, individuals with ASPD also were diagnosed with BPD 51% of the time, but only 14% of individuals with BPD met the diagnostic criteria for ASPD (Stuart et al., 1998).

Both BPD and ASPD are noted for symptoms of impulsiveness, aggression and an emotionally volatile pattern of relating to others (Burnette, South, & Reppucci, 2007). ASPD is marked by a cold, interpersonally exploitative way of interacting with others, in addition to engaging in criminal behaviour (APA, 2000). Hence, individuals with BPD who behave in violent, calculated or particularly deceitful ways may be more likely to receive an additional diagnosis of ASPD (Gunderson & Links, 2008). Additionally, within prison settings, the majority of women who have engaged in criminal behaviour do not meet the diagnostic criteria for full ASPD, yet approximately two thirds of men in prison meet the diagnostic criteria for ASPD (Widiger et al., 1996). This may be due to the fact that women are more likely to engage in relational aggression (e.g., social isolation), whereas males are more likely to engage in overt aggression such as physical violence (Burnette et al., 2007). Another personality disorder which is closely linked to inappropriate anger, aggression and feelings of entitlement is Narcissistic Personality Disorder.

Narcissistic personality disorder

Comorbidity of BPD and Narcissistic Personality Disorder (NPD) has received relatively little research attention. However, it has been suggested that individuals with comorbid BPD and NPD have a more serious prognosis than all other personality disorders and present a considerable treatment challenge (Cukrowicz & Joiner, 2005; Kernberg, 2007). Both BPD and NPD may have co-occurring symptoms of inappropriate anger, suicidality and feelings of entitlement (Gunderson & Links, 2008). Individuals with BPD and NPD experience unstable self-image and sense of self. This vulnerability may mean that these individuals are

particularly sensitive to criticism, yet devalue the accomplishments of others, and experience heightened feelings of humiliation or emptiness (Cukrowicz & Joiner, 2005).

There is some indication that individuals with BPD who also have narcissistic features appear to be at greater risk for reckless and impulsive behaviours (Critchfield et al., 2008), particularly SRDs (Sher, Trull, Bartholow, & Vieth, 1999). Individuals with BPD who engage in self-destructive behaviours are more likely to have a pattern of behaviour which is triggered by fear of isolation and abandonment, designed to regain caring attention. In contrast, individuals with NPD are less likely to have an established pattern of self-destructive behaviour, but may still respond aggressively to a perceived attack on their grandiosity and omnipotence. Furthermore, it is likely that they find the idea of being viewed as needy humiliating (Gunderson & Links, 2008).

In addition to ASPD and NPD, the other Cluster B diagnosis which has been closely linked to BPD is HPD. Although this disorder does not share the same symptoms of relational aggression or difficulties with anger, the dramatic aspects of the HPD presentation such as impressionistic speech, may certainly add to the affect regulation difficulties experienced by people with BPD.

Histrionic personality disorder

The modest amount of research on HPD has indicated a persistent problem in differentiating HPD from other personality disorders, most notably BPD (Blagov & Westen, 2008). Research consistently has found a high degree of comorbidity between BPD and HPD, yet it has been difficult for researchers to establish exactly

why this is the case. Certainly, there are some issues, such as poor discriminant validity and comorbidity that are often difficult to address (Lilienfeld et al., 1994). Some of the DSM-III (APA, 1980) diagnostic criteria for HPD were removed from DSM-III-R (APA, 1987), notably, excitement craving, angry outbursts and manipulative parasuicidality, due to excessive overlap with other personality disorders. The DSM-III-R (APA, 1987) reintroduced inappropriate seductiveness and impressionistic speech, whereas DSM-IV-TR (APA, 2000) discontinued two diagnostic criteria, that is, low frustration tolerance and constant demands for reassurance or praise. These criteria do not contribute to the internal consistency of a HPD diagnosis (Pfohl, 1991). It also has been suggested that the DSM-IV-TR (APA, 2000) arbitrarily sets a high diagnostic threshold for HPD (Blagov & Westen, 2008).

Individuals diagnosed with BPD and HPD share features such as fears of rejection and abandonment, anxiety, dependency, emotional instability, a tendency to catastrophise and difficulty with self-soothing (Shedler & Westen, 2004). In addition, some researchers have suggested that there may be a histrionic subtype of BPD (Wilkinson-Ryan & Westen, 2000).

Summary

The influencing factors of psychopathology in individuals who engage in NSSI are certainly extensive, and there has been a great deal of research attention given to this area. For individuals without BPD, a range of Axis I disorders have been identified, however, anxiety disorders, mood disorders, substance use and eating disorders tend to be most commonly associated with NSSI. For individuals with BPD, this relationship is far more complex. It has been identified that so-called

'purely borderline' individuals are rare, and it is more often than not the case that these individuals will have additional psychopathology that may influence their behaviour. Nevertheless, a proportion of this additional psychopathology can perhaps be explained by considering the broader context of borderline symptoms. For example, it makes sense that individuals with BPD would have additional difficulties with substance use and eating disorders, as examples of self-destructive behaviour, and symptoms of anxiety and depression can be accounted for by affective instability. Certainly, there is a great deal of overlap between symptoms of BPD and other disorders, namely BP and other Cluster B disorders. However, it is apparent that closer attention to differential diagnosis may improve issues related to comorbidity. Paris (2008) argued that overlaps with other Axis II disorders are not necessarily clinically meaningful (ASPD is one exception), and that co-occurrence simply highlights the imprecision of the Axis II classification system. He further argued that BPD makes more sense as an Axis I disorder, given that virtually all Axis I disorders can be comorbid with BPD.

In addition to the presence of DSM-IV-TR (APA, 2000) diagnoses, there are other symptoms which are likely to influence the motivational factors behind NSSI in both BPD and NBPD groups. The following section will attempt to address the potential influence from factors that are not necessarily attributable to a specific DSM-IV-TR (APA, 2000) diagnosis, such as dysfunctional beliefs, perceived control, anger and impulsivity.

Other symptomatology in individuals who engage in NSSI

Individuals who engage in NSSI also report significantly higher levels of

psychological symptomatology which may not accompany a clinical diagnosis per se. For the approximate 12% of individuals who engage in NSSI but who do not meet the diagnostic criteria for any psychiatric disorder (Nock & Kessler, 2006), there must be other factors that influence the occurrence of the behaviour. The wealth of research literature which has been dedicated to associated experiences (e.g., anger, dissociation, and trait impulsivity) suggests that it is worth investigating other contributing factors.

For example, anger is a symptom of several psychological disorders, yet a large proportion of individuals who regularly experience feelings of anger would not necessarily meet the diagnosis for any disorder (Spielberger, 1999). Many people experience anger but do not express it to others (Kassinove, 1995; Spielberger, 1999). It may be the case that individuals who express anger via means of angry outbursts and aggressive behaviour are more likely to draw clinical attention than those individuals who suppress their anger (Kassinove, 1995).

It also may be true that, for some individuals, frequent feelings of anger are more closely associated with a particular cognitive style or belief system. In line with this, the individual's view of the world and their belief system may contribute to an acceptance of NSSI as a means of coping, despite the fact that societal norms perhaps should discourage the behaviour (Haines & Williams, 2003; Walsh & Rosen, 1988). An examination of the cognitive distortions and irrational beliefs associated with NSSI may provide information about a specific cognitive pattern associated with the behaviour. Similarly, factors such as perceived stress and perceived controllability of internal and external stimuli are potential contributing motivational factors associated with NSSI. Indeed, factors such as these may occur in conjunction with NSSI more

frequently than the presence of specific psychopathology. The following sections review the influence of a range of these motivational factors.

Anger

Anger has been described as a 'moral' emotional response (D'Arms & Jacobson, 1994) that tends to promote approach tendencies, in the form of attack (Hutcherson & Gross, 2011). The regulation of anger also is strongly related to cognitions, particularly the assumption that negative consequences for the self are purposefully intended by others (Roseman & Kaiser, 2001).

Early researchers interpreted self-injury as an expression of anger and hostility directed towards the self (e.g., Menninger, 1935). Since that time, researchers have emphasised the role of aggressive feelings in self-injury, both internal and external. Internalised anger (i.e., anger towards the self) has been reported in different studies by 18% to 45% of individuals who engage in NSSI, and 10% to 32% have reported anger towards others as preceding NSSI (Bennum, 1983; Gardner & Gardner, 1975; Lloyd-Richardson et al., 2007; Milligan & Andrews, 2005). In contrast, self-injury has been considered to be the result of a profound incapacity to express aggression effectively and externally (Raine, 1982).

Externalised anger (anger directed at others, also referred to as extrapunitive hostility) also has been associated with individuals who engage in self-injury. Earlier research has described individuals who engage in self-injury as aggressive and hostile (Grunebaum & Klerman, 1967; Pao, 1969; Simeon et al., 1992). Some researchers also have suggested that individuals who engage in self-injury obtained higher scores on measures of irritability and hostility expressed either verbally or

physically (Darche, 1990) and have exhibited overt hostility and impulsively aggressive behaviour (Graff & Mallin, 1967). In one study, higher levels of extrapunitive hostility, in particular the urge to act out hostility, were demonstrated for a self-injury group in comparison with depressive and medical control groups (Bennum, 1983). In another study, it was found that individuals who engaged in self-injury displayed violent behaviour towards others more frequently than did those individuals who engaged in self-poisoning (Robinson & Duffy, 1989).

Furthermore, another study also found that prisoners who engaged in self-injury scored higher on measures of the impulse or urge to act out hostile feelings towards others, critical feelings towards others, paranoid feelings of hostility and feelings of guilt than prisoners who did not engage in self-injury and a non-prisoner control group (Haines, Williams, & Brain, 1995). In contrast to these findings, 80% of individuals who engaged in self-injury (N = 240) stated that they could never harm anyone else (Favazza & Conterio, 1989). All the participants in this study were female. Of course, it is important to consider the fact that prisoner populations contain an over-representation of females with BPD, compared to the general population (Nee & Farman, 2005), and this would play a role in anger and aggression.

BPD and anger

The role of anger in BPD was discussed in detail in Chapter 3. It is known that difficulty with the expression and management of anger is a core feature of BPD. In particular, individuals with BPD may be prone to angry rumination (Selby et al., 2008), aggression and hostility (e.g., Skodol et al., 2002), particularly in the context

of impulsivity. This has lead several researchers to suggest that 'impulsive aggression' is a central feature of BPD (Critchfield et al., 2008). However, prevalence of this behaviour can vary substantially among individuals with BPD, depending on the definition and measure used (Critchfield et al., 2008).

In terms of a specific relationship between BPD, anger and NSSI, research has indicated that individuals with personality disorders who engage in self-injury demonstrate a higher lifetime history of aggression than individuals diagnosed with personality disorder who do not engage in self-injury (Simeon et al., 1992). In that sample, degree of self-injury was positively correlated with chronic anger. The aggressive affect that was reported to precede self-injury was demonstrated to be a long-standing trait for these individuals and significantly differentiated the self-injury and control groups.

The expression of anger in BPD is frequently related to underlying feelings of anxiety, particularly in regards to interpersonal interactions (Linehan, 1993; Paris, 2008). One study indicated that individuals with BPD who experience anxiety and avoidance in romantic relationships are more likely to lash out in an aggressive way when they feel provoked. Furthermore, avoidance in romantic relationships also predicted the incidence of NSSI, but not anxiety (Critchfield et al., 2008).

Closely linked with the role of anxiety in NSSI is the degree to which individuals can be considered to be impulsive, and whether or not this contributes to the reasons that individuals choose to engage in NSSI. In particular, research has been interested in the potential influences of trait impulsivity and venturesomeness on BPD (e.g., Jacob et al., 2010).

Impulsiveness, venturesomeness and empathy

The role of impulsivity in NSSI was covered extensively in Study 2, and venturesomeness and empathy mostly are used as control scales, so will only be discussed briefly here. Venturesomeness refers to thrill and adventure seeking and risk-taking tendencies, and also can be defined as 'normal' or healthy impulsivity (Eysenck & Eysenck, 1978). The empathy subscale in the EIS is primarily used as a control dimension, and is included in the inventory as a distractor. Previous studies using the EIS with BPD individuals have found that scores for impulsiveness tend to be significant, and can differentiate BPD from NBPD individuals. However, people with BPD do not differ from individuals without the disorder on facets of venturesomeness and empathy (e.g., Cottraux et al., 2009; Jacob et al., 2010).

In addition to behaviours being used to regulate emotion, cognitive processes (such as reappraisals, Gross, 1998b) may also play an important role in the regulation of emotions. The research literature suggests that an examination of the cognitive processes involved in the maintenance of NSSI is important.

Cognitive factors and beliefs

One such cognitive emotion regulation strategy is rumination (Nolen-Hoeksema, 1991) or the tendency to repetitively think about the causes, situational factors, and consequences of one's emotional experience. Other strategies may include thought suppression and catastrophising. Within the diathesis stress model, it is apparent that cognitive style may impact on the way an individual copes with stressful life events. For example, individuals who demonstrate cognitive rigidity in their views and beliefs may be more resistant both to the adoption of cognitive-based

coping methods and behaviour change in general.

One model that has been used to account for a wide range of psychological difficulties is reflected in the work of Ellis (Ellis, 1962). He proposed that irrational self-talk and negative evaluations lead to psychological disturbance (Ellis & Harper, 1975). The model holds that when the individual is faced with an activating event (A), an individual will experience an emotional consequence (C). However, in this model it is not A that causes C. Rather, the link between A and C is mediated by the individual's interpretation of A which reflects that individual's belief system (B) (Ellis, 1962). Put simply, Ellis's model can be described as a cognitive-affective behavioural theory.

A percentage of the variance of irrationality may be accounted for by what might be termed normal functioning (Forman & Forman, 1979). However, a substantial percentage of that variance would be accounted for by psychological processes that are of clinical concern. There are a number of beliefs that can be identified as irrational and stress-evoking (Ellis & Harper, 1975). Ellis proposed ten specific irrational beliefs which may be associated with a wide range of symptoms. These ten beliefs include: (1) you must be unfailingly competent and perfect in everything you undertake (2), it is an absolute necessity to have love and approval, (3) when people act unfairly, they are evil, (4) the past has a lot to do with determining the present, (5) emotions are controlled by external events, (6) you should feel fear or anxiety about anything that is unknown or uncertain, (7) life should be easier/better than it is, (8) it is horrible when things are not the way you want them to be (9), it is better to avoid than face responsibilities, and (10) you need something greater than yourself to rely on.

In addition to Ellis's work, Beck (1967) offers a different approach which emphasises the nature of thought form. Whereas Ellis described cognitive distortions in terms of irrationality (Ellis & Harper, 1975), Beck (1967) adopted illogicality to define his interpretation of cognitive dysfunction. Cognitions which are illogical are defined within the cognitive triad, which refers to the patterns of thinking related to the self, the world and the future. Beck further proposed that these patterns of thinking predispose individuals to depression (Beck, 1967). Furthermore, Beck identified types of illogical cognitions that are maladaptive including overgeneralising, selective abstraction, excessive responsibility, assuming temporal causality, self-references, catastrophising and dichotomous thinking (Beck, 1967). Differences in the type of psychopathology caused by the two types of cognitive dysfunction have been identified, although the distinction may be somewhat superficial. In general, irrational beliefs have been linked to elevated levels of anxiety and illogical cognitions with elevated levels of depression (Lohr & Bonge, 1981).

Despite the differences in Beck and Ellis's approaches, it is possible that there is a common cognitive mechanism underlying both approaches. In a study by Lohr and Bonge (1981), results demonstrated that the relationship between cognitive dysfunction and anxiety was accounted for by the correlation between trait anxiety and scores on the measure of irrational belief. It was concluded that the constructs of irrational beliefs and illogical cognitions are distinct constructs which measure different aspects of dysfunctional thinking. Each of these formulations is applicable within the clinical setting (Hawton, Salkovskis, Kirk, & Clark, 1989), however, a decision was made to specifically examine the irrational thinking of individuals who

engage in NSSI in line with previous research in this area.

Individuals with high levels of psychological distress are more likely to report significant levels of irrationality (LaPointe & Crandell, 1980). In addition, holding irrational beliefs tends to be associated with elevated levels of anxiety (Lohr & Bonge, 1981), with the strongest correlations between irrationality and trait anxiety (Gitlin & Tucker, 1988). A significant correlation also has been found between general irrationality and external locus of control (Wright & Pihl, 1981). In addition, endorsement of irrational beliefs is linked to anger and hostility (Ellis, 1962), which may be ameliorated by modification of these beliefs (Hamberger & Lohr, 1980).

Certain patterns of irrational beliefs may predispose an individual to particular types of emotional distress. For example, in one study anger was predicted by irrational beliefs relating to perfectionism, anxiety about the unknown, blame proneness and catastrophising (Zwemer & Deffenbacher, 1984). In addition, Zwemer and Deffenbacher (1984) found that anxiety was related to perfectionism, anxiety about the unknown, catastrophising and problem avoidance. The overall effect of the endorsement of irrational beliefs may be that they increase the likelihood of the individual experiencing psychological stress, and increase the vulnerability of the individual to the adverse effects of a negative life event. However, one study indicated that the endorsement of irrational beliefs was not related to negative life events and subsequent distress. Instead, the relationship that was found was between negative life events and physical distress (Smith, Boaz, & Denny, 1984). This finding is contrary to a review of the literature which indicated that the endorsement of irrational beliefs was associated with negative ruminations and not arousal (Smith et al., 1984).

There has been relatively little research attention given to the issue of irrational beliefs in individuals who engage in NSSI. However, researchers have acknowledged the importance of reviewing the belief systems of individuals who engage in the behaviour (e.g., Simeon & Hollander, 2001).

Irrational beliefs and NSSI

Walsh and Rosen (1988) and Walsh (2006) outlined a cognitive approach to NSSI that provides a comprehensive overview of the irrational beliefs that individuals who engage in NSSI are likely to endorse. They provided four categories of illogical or irrational thoughts that lead an individual to engage in NSSI.

Firstly, the individual who engages in NSSI must believe that the behaviour is acceptable. The authors acknowledged that this acceptance may be conscious or unconscious. The individual must also hold the view that the behaviour provides some advantage or benefit. The second category of belief is that individuals hold the view that they and their bodies are disgusting and that they are deserving of punishment. Certainly, many of the self-critical thoughts of individuals who engage in NSSI relate to issues of body image. The belief that they are deserving of punishment is a consequence of general self-hate and the identification of the body as a target for this self-hate. The authors suggested that this cognitive style is closely related to low self-esteem.

The third category of dysfunctional thought that leads to NSSI is that individuals believe that some type of action is necessary to terminate or reduce that unpleasant state. Thus, to alleviate these feelings, the individual feels the need to engage in self-defeating behaviour, including NSSI. Again, it frequently has been

identified that individuals who engage in NSSI also engage in a wide range of impulsive, self-destructive behaviours that represent an attempt to regulate affect. Specific to NSSI, it is often the case that unpleasant emotions escalate to the point where action needs to be taken. With the belief that NSSI is acceptable and the body is disgusting and deserving of punishment, it is then unsurprising that the action performed to reduce negative affect takes the form of self-injury. This process is reinforced by the knowledge that the action will be an effective way of producing tension reduction (Brain et al., 1998a, 1998b; Favazza & Conterio, 1989; Haines, Williams, & Brain, 1995; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Lion & Conn, 1982; Pao, 1969; Rosenthal et al., 1972; Simpson, 1976; van Moffaert, 1990).

Lastly, the authors described a category of dysfunctional thought that some action needs to be taken in order to successfully communicate or express distress to others. Individuals who engage in NSSI hold the belief that others will not understand the nature and extent of their distress unless there is some physical demonstration of this distress. Further, individuals who engage in NSSI do not comprehend the lack of action in those who do not self-injure.

Other authors have researched the role of schemas held by individuals who engage in NSSI, and suggested that overgeneralising and dichotomous thinking contribute to negative schemas about themselves and the world (Slee, Arensman, Garnefski, & Spinhoven, 2007). Another study suggested that there are four negative schemas, in particular, that distinguish those who engage in NSSI from those who do not. These schemas include: (1) emotional deprivation and the belief no one can provide adequate emotional support, (2) loneliness and the belief that one is different

from others, (3) mistrust and the belief that others will hurt, humiliate, or abuse them, and (4) a fundamental belief that they lack self-control (Castille et al., 2007). This formulation sheds light on some of the possible cognitive distortions held by individuals who engage in NSSI. However, it would appear that there has been no formal investigation of irrational thinking in individuals who engage in NSSI who do and do not have BPD.

Cognitive factors in BPD

In the BPD literature, it has been suggested that symptoms such as affective instability, anger and impulsivity can occur as a result of maladaptive core beliefs (e.g., Meyer, Leung, Feary, & Mann, 2001). The presence of cognitive symptoms in BPD is still not well understood and, according to some researchers, provides a good basis for rejecting a unidimensional model of the disorder. Specific cognitive symptoms in Cluster B and Cluster C personality disorders are rarely identified or given as much attention as those in Cluster A (Zanarini et al., 1990). Therefore, it is possible that cognitive symptoms associated with BPD are derived from a separate endophenotpye (Paris, 2007).

As is the case for the research literature in NSSI, little research attention has been given to the specific role of irrational beliefs in BPD. However, a small amount of research attention has been given to Beck's (1967) model of dysfunctional beliefs and Young's schema theory (Young, 1990). It is known that individuals with BPD hold a range of dysfunctional beliefs, which are likely to be triggered by emotional dysregulation (Gunderson, 2001). It has been suggested that core dysfunctional beliefs in individuals with personality disorders tend to be inflexible and resistant to

change (Beck et al., 1990).

Beck and colleagues (1990) published a list of dysfunctional beliefs associated with specific personality disorders which were derived from individualised conceptualisations of patient problems. A list of beliefs for BPD was omitted as the authors noted that the beliefs of these patients seemed to exceed the categorisations made in relation to other personality disorders. Despite this, a triad of cognitive distortions believed to be typical of BPD has been suggested. It is believed that individuals with BPD are likely to endorse three specific cognitive distortions: (1) I am a helpless person, (2) It is a hostile world, and (3) Everything is all or nothing (Alden & Osti, 1989). Other researchers (see Arntz, Dietzel, & Dreessen, 1999) have borrowed from Schema theory and proposed a number of themes commonplace to BPD, including aloneness ("I will always be alone"), dependency ("I cannot manage by myself, I need someone to fall back on"), unlovability ("If others get to know me they will find me rejectable and will not be able to love me"), emptiness ("I do not really know what I want"), lack of personal control ("I cannot discipline myself"), badness ("I am an evil person and I need to be punished for it"), interpersonal distrust ("Other people are evil and abuse you") and vulnerability ("I'm powerless and vulnerable and I cannot protect myself").

Similarly, in another study using the Personality Belief Questionnaire (PBQ) it was found that 14 items were consistent with patterns of psychopathology in BPD, including themes of dependency, helplessness, distrust, rejection/abandonment fears, fear of losing emotional control, and histrionic behaviour (Butler, Brown, Beck, & Grisham, 2002). Within the cognitive theory of BPD it can be understood that these beliefs are latent until they are activated by an external event (Butler et al., 2002).

The individual with BPD processes information in a black and white fashion, which creates feelings of anxiety, frustration, depression and shame. In order to relieve these feelings, the individual with BPD engages in self-destructive behaviours (serving internal motivations), and may act out against others (serving external motivations) in an attempt to punish them for perceived threat, betrayal and withholding what is needed (Butler et al., 2002).

Closely related to the negative cognitions that are experienced by individuals who engage in NSSI is the role of stress. Specifically, it may be important to examine the individual's subjective perceptions of stress as a motivating factor for engaging in NSSI.

Perceived stress

The research literature has indicated that stress is an important antecedent of NSSI. Stress has been defined as an individual experience which varies in relation to life events, personal resources, and the subjective appraisal of these two factors (Dise-Lewis, 1988). Stress sometimes can serve as a source of positive growth, although more frequently it is viewed as a risk factor for psychopathology (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). The concept of stress has been explored by its association with two general types of stressors, namely major (mostly negative) life events and daily hassles. Major life events are critical or traumatic events that are usually non-normative in nature, whereas daily hassles are more proximinal and occur with greater frequency than major events (Williams & McGillicuddy-DeLisi, 2000). Research has indicated that negative life events and life problems may precipitate self-injury, particularly interpersonal problems (Haw &

Hawton, 2008). Garrison et al. (1993) also found a positive relationship between undesirable life events and risk of engaging in self-injury.

Hence, it is apparent that both research and clinical practice tends to emphasise objective factors in the determination of what causes individuals to be stressed, and indeed what level of stress is judged as pathological under which situations. However, there has been increased emphasis on the role of subjective factors and transactional models which highlight the importance of the individual's cognitive appraisals of the nature of challenges, threats, harm or losses (Lazarus & Folkman, 1984). In addition, findings from trauma research have suggested that the individual's subjective perception of threat (in addition to, or as opposed to threat which is identified objectively by DSM-IV-TR, [APA, 2000] criteria), plays an important role in the development of PTSD (e.g., Brewin, Andrews, & Rose, 2000; Feinstein & Dolan, 1991).

The construct of stress reactivity has been used to explain why some individuals may experience similar stressful situations, yet respond differently. Stress reactivity comprises individual differences in physiological, cognitive and emotional responses to stress (Compas et al., 2001). Highly reactive individuals have a lower threshold of initial response, are slower in their return to baseline, and display greater reactivation of arousal with repeated exposure to stress. Individual differences in reactivity to stress appear to relate to coping as they may affect the individual's initial automatic response to stress and inhibit or facilitate particular coping resources (Compas et al., 2001). It has been stated elsewhere that individuals who engage in NSSI may experience autonomic hyperarousal which appears to be related to affect regulation. Hence, an individual's reaction to perceived stress may be more important

to understanding the relationship between stress, affect regulation and NSSI than the objective measurement of stress to which one has been exposed.

BPD and perceived stress

Individuals with BPD are likely to experience high rates of negative life events and, therefore, experience elevated levels of perceived stress (Jovev & Jackson, 2006). An epidemiological survey indicated that more than 28% of individuals with PDs had five or more life events in the past year compared with 11% of those without PDs (Samuels, Nestadt, Romanoski, Folstein, & McHugh, 1994). Several of these events suggested the sources were difficulties with interpersonal relationships (e.g., involvement in a fight, extramarital affairs) and with self-destructive behaviours (e.g., alcohol and drug related problems and participation in criminal activities). Similarly, a considerable amount of research attention has been given to objective factors associated with stress such as the role of the experience of trauma in the development of BPD.

Yet, subjective factors relating to perceived stress appear to have a greater influence over the individual's ability to cope and function than an assessment of objective factors. Indeed, it would seem that the application of logic to the understanding of the way that individuals with BPD experience stress is somewhat futile. It also is of interest that levels of psychosocial functioning in individuals with BPD do not appear to change with the increase in number of recent life events. However, for individuals without BPD, the total number of stressful life events is related to levels of psychological adjustment (Brown & Harris, 1989; Jovev & Jackson, 2006). This is despite the common view that for individuals with BPD, their

experiences of stress are likely to be more frequent, intense and of greater duration than those individuals without BPD. Hence, it may be the case that the crises that occur are associated with the clinical course of the disorder (Jovev & Jackson, 2006). Certainly, the stress research literature has emphasised the role of temperament and personality factors which may function as risk or protective factors for the development of psychopathology (e.g., Rothbart & Ahadi, 1994).

Exposure to stressful life events in individuals with BPD may lead to exacerbation of symptoms, including an increase in suicide attempts and NSSI (Jovev & Jackson, 2006). Within the affect regulation model of NSSI, it makes sense that the subjective experience of stress is related to physiological arousal and, perhaps, a low level of tolerance for experiences of unpleasant emotional states. This, perhaps, also is related to the dysfunctional belief that engaging in some kind of self-destructive behaviour is necessary to terminate or reduce that unpleasant state associated with NSSI (Walsh & Rosen, 1988).

These types of beliefs may be closely related to the individual's subjective feelings of control. In particular, it may be of importance to consider the degree to which individuals feel that they have control over their emotions, as this may influence their motivations for engaging in NSSI.

Perceived control

Perceived control is "the belief that one can determine one's own internal states and behaviour, influence one's environment and/or bring about desired outcomes" (Wallston, Wallston, Smith, & Dobbins, 1987, p. 5). A perceived lack of control over both external events and one's own internal responses has been shown to

have a significant negative impact on the individual's psychological adjustment, health and motivation (Gatchel, 1980; Syme, 1989; Thompson & Spacapan, 1991). In a review of the literature on control, Skinner (1995) suggested that "loss of control is one of the few forms of psychological trauma that researchers can agree is universally aversive" (p. 3).

Using different terminology, a two-process model of control has been suggested by Rothbaum, Weisz, and Snyder (1982). The authors stated that individuals are strongly motivated to maintain a sense of control, and that this can be achieved in a number of ways. For example, if control cannot be achieved by acting directly to change the environment (primary control) then it may be achieved by less direct means that involve the use of cognitive strategies to accept the situation (secondary control). The authors suggested that primary and secondary control are complementary processes, and that both are adaptive in different situations. Furthermore, good adjustment requires the individual to apply flexibility in recognising which approach is appropriate.

Research considering the exercise of control over emotions and cognitions has become an important component in the coping literature. Perceived control forms a component of Lazurus and colleagues' transactional model of coping (Cohen & Lazarus, 1979; Folkman, Schaefer, & Lazarus, 1979). In this model, two different coping approaches are defined: problem focused (aimed at influencing the disturbing event itself) and emotion focused (aimed at dealing with the emotional impact of the event).

In general, problem-focused coping is understood as a more adaptive approach (Thoits, 1995), however, emotion-focused coping strategies may still play

an important role. Folkman and Lazarus (1980) suggested that in any stressful situation the individual must deal with not only the demands of the external situation itself, but also the emotional response that this event generates. The ability to effectively deal with an event depends on the individual's ability to regulate his/her emotional response or reaction to an event. Although it is recognised that a certain degree of emotional arousal may be necessary to facilitate effective coping, an excessive degree of arousal may interfere with effective coping. For example, a heightened degree of arousal associated with anxiety, fear or anger may interfere with the individual's ability to think clearly and engage in effective problem solving (Folkman, 1984).

Perceived control of one's internal state

Recent research has suggested that perceived control of one's internal states may be just as important as perceived control of external events (Pallant, 2000). Indeed, in some contexts, perceived control over the emotional consequences of events may be more important to the individual's overall adjustment than control over the situation itself. Internal states may refer to emotions, thoughts, and physical reactions (Thompson, Nanni, & Levine, 1994; Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993).

The role of perceived control over internal states has been emphasised across a broad range of research and it is apparent that there is overlap with theories regarding self-control or self-regulation (e.g., Carver & Scheier, 1981; Karoly & Kanfer, 1982; Mahoney, Thoresen, & Danaher, 1972). This notion of mental control over one's internal states also is a major component of emotional intelligence (see

Goleman, 1995 for a review).

The importance of control of internal states is evident within the clinical literature, particularly in the area of stress management (Pallant, 2000). Certainly, the emphasis in many CBT interventions is to enhance the individual's ability to control some aspect of their internal states, including control over arousal (e.g., relaxation training, exposure to panic symptoms, etc.) and thought processes (e.g., cognitive restructuring). Several authors have suggested that perceived control may be a common pathway for a range of different coping responses (relaxation, positive self-talk, distraction, etc.) and that these strategies share a common feature in that they are only effective if they engender a belief of control over environmental and/or somatic events (e.g., Mineka & Kelly, 1989; Steptoe, 1989). For individuals with BPD, engendering a sense of control is likely to have important implications for the effective management of affect regulation strategies and the treatment of self-destructive behaviours.

The role of perceived control of internal states also has been examined in the health literature including research with cancer patients and individuals diagnosed with HIV. In a study of perceived control in adjustment to cancer, it was more important for participants to believe that they could control their emotional reactions and physical symptoms than that they could control the course of the disease (Thompson et al., 1993). A further study exploring central versus consequence-related control in a sample of HIV-positive men reported that consequence-related control was more closely related to depression than control of the illness itself (Thompson et al., 1994).

Despite the interest in control of internal states in the literature, relatively

little research has been conducted in this area, at least in comparison to the wealth of literature on the individual's perception of control of external events. The reason for this, perhaps, is partially due to the fact that there are relatively few scales which have been developed that focus specifically on control of internal states (Pallant, 2000). It also appears that the role of perceived control of internal states has not yet been examined with specific reference to NSSI. This is surprising given the important implications that perceived control of internal states may have for affect regulation theory. Hence, an investigation of this relationship may delineate some of the further symptomatological and motivational factors associated with NSSI and other impulsive behaviours and improve interventions and general management programs for individuals who engage in these behaviours.

Summary

In addition to the influence of psychopathology, there are other factors that appear to play a role in motivating the individual to engage in NSSI. For example, anger appears to be an important contributing factor, whether it is to do with poor control of the expression of anger, or the suppression of angry feelings. For individuals with BPD, anger appears to have an important relationship between impulsivity and interpersonal relationships. Cognitive processes also play an important role in the regulation of emotions. Cognitive style also is likely to have an impact on the way in which the individual copes with stress. It has been suggested that certain irrational beliefs contribute to psychopathology and poor adjustment. In particular, a strong relationship has been identified between irrationality and trait anxiety (Gitlin & Tucker, 1988), and irrationality and external locus of control

(Wright & Pihl, 1981). Individuals who engage in NSSI tend to be anxious and experience low levels of perceived control over internal and external events, so perhaps it is likely that the endorsement of certain irrational beliefs is specific to the functioning of individuals who engage in NSSI. In the case of BPD, it is known that a range of dysfunctional beliefs are likely to be triggered by emotional dysregulation (Gunderson, 2001).

The research literature also has indicated that stress is an important antecedent of NSSI. Individuals who engage in NSSI tend to have a greater number of negative or stressful life events, with an emphasis on interpersonal problems as a precursor to engaging in NSSI (Garrison et al., 1993; Haw & Hawton, 2008). In particular, individuals with BPD are likely to have experienced a greater number of stressful life events than people without BPD and this may exacerbate symptoms, including an increase in suicide attempts and NSSI (Jovev & Jackson, 2006). Of course, it is important to note here that the individual's appraisal of stressful life events has a greater impact on the development of psychopathology than the sheer number of events (Updegraff & Taylor, 2000).

Closely related to the influence of perceived distress is the role of perceived control over external and internal factors. A perceived lack of control over both external events and internal responses has been shown to have a significant negative impact on psychological adjustment, health and motivation (Gatchel, 1980; Syme, 1989; Thompson & Spacapan, 1991). Recent research has suggested that perceived control of one's internal states may be just as important as perceived control of external events (Pallant, 2000). Indeed, in some contexts, perceived control over the emotional consequences of events may be more important to the individual's overall

adjustment than control over the situation itself.

It apparent then, that there are important additional factors which may contribute to the development and maintenance of NSSI. Some of these factors have yet to be fully explored. Further investigation may delineate some of the symptomatological and motivational factors associated with NSSI and other impulsive behaviours which have been overlooked. This then would improve interventions and general management programs for individuals who engage in these behaviours, and perhaps highlight any further important differences between individuals with and without BPD who engage in NSSI. The following chapter is dedicated to an empirical investigation of some of these issues. Study 3 will attempt to identify differences between BPD and NBPD individuals in terms of their motivations for engaging in NSSI, by closely examining internal as well as external motivational factors.

CHAPTER 9

STUDY 3: Motivational and cognitive factors associated with NSSI in individuals with and without BPD

INTRODUCTION

A determination of the motivations that individuals have for engaging in NSSI may be based on a combination of internal as well as external factors. An investigation into the symptomatological factors (e.g., anger and perceived stress), as well as cognitive factors (e.g., irrational beliefs and perceived level of control over one's emotions) may also provide further insight into this behaviour. Delineating motivational aspects of NSSI is important so that treatment options for individuals who engage in the behaviour can be improved (Hjelmeland et al., 2002; Laye-Gindhu & Schonert-Reichel, 2005).

Various authors have attempted to classify into categories the possible reasons that individuals have for engaging in NSSI (e.g., Nock & Prinstein, 2004, 2005; Osuch et al., 1999). Generally speaking, cognitions associated with individuals' reasons for engaging in NSSI can be divided into four categories. Firstly, there are intropunitive responses to NSSI (e.g., the belief that one is a bad person and must be punished). Secondly, individuals may have a need to regulate emotions (e.g., to decrease anger, fear or emptiness, to regain a sense of reality). Thirdly, the decision to engage in NSSI may be motivated by a need to communicate distress (e.g., to express anger or show others how hurt one is feeling). Finally, individuals may endorse motivations which reflect an approach response to the behaviour (e.g., the need for self-stimulation and a view that NSSI is positive and enjoyable). The following section will outline these motivations for NSSI in more detail.

Motivations for NSSI

Some researchers have stated that NSSI serves as a means of self-punishment,

and of gaining control of and/or detaching from negative emotional experiences (Osuch et al., 1999; Rodham et al., 2004; Suyemoto, 1998). In particular, it appears that women are more likely than men to report self-punishment as a motivation for NSSI (Claes et al., 2007), and there may be a specific relationship between NSSI, self-punishment motivations and eating disorders (e.g., Bolognini et al., 2003; Cross, 1993). In this way, it may be the case that intropunitive motivations for NSSI are closely related with self-hatred and negative cognitions about one's body and the subsequent view that s/he is deserving of punishment (Walsh, 2006).

Closely related to intropunitive motivations is the role of negative affect and the view that engaging in NSSI will be an effective way of producing tension reduction (Brain et al., 1998a, 1998b; Favazza & Conterio, 1989; Haines, Williams, & Brain, 1995; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Lion & Conn). One of overarching internal motivations for NSSI appears to be affect regulation. Previous research has identified internal motivations for NSSI, such as, suicide prevention, and to cope with experiences of loneliness, anger, dissociation, emptiness, dysphoria and hopelessness (Bennum, 1983; Bohus et al., 2000; Brown et al., 2002; Chapman et al., 2005; Favazza, 1996; Favazza & Conterio, 1989; Kemperman et al., 1997; Miller, 2005; Walsh & Rosen, 1988).

Additionally, the need to 'escape' negative emotions has been a recurring theme in the research literature investigating motivations for NSSI (Boegers et al., 1998; Rodham et al., 2004; Ross & Heath, 2003). NSSI then can be viewed as a maladaptive coping strategy which is used to manage these symptoms of internal emotional distress (Haines & Williams, 2003; Kleindienst et al., 2008). However, as identified in Study 1, it may not be the case that NSSI always serves to reduce

distress that is accompanied by a high level of arousal. For individuals with BPD, NSSI may serve to help the individual cope with unpleasant feelings of boredom by increasing arousal and providing a self-stimulatory purpose. In this way, some individuals may demonstrate an approach response in their motivations for engaging in NSSI.

Generally speaking, the research literature seems to suggest that the primary motivation for NSSI is to remove negative affect, thus suggesting that NSSI is negatively reinforced. Similarly, when positive affect as a consequence of NSSI is discussed it generally has been assumed that the individual's accompanying arousal state is low, rather than high. Although the role of NSSI in regulating negative emotions is important, an adequate conceptualisation of the process of affect regulation should consider both increases and decreases across a range of emotional states, and not just negative emotions (Gross, 1998a). Certainly, this low positive arousal state may occur for the majority of individuals who engage in NSSI. However, results from Study 1 appeared to indicate that for individuals with BPD, NSSI is associated with self-stimulatory motivations and a desire for excitement.

In addition, the communication of distress as a motivation for NSSI has been reported for individuals with BPD. NSSI may then represent an operant behaviour (Bostock & Williams, 1974; Henderson & Lance, 1979; O'Connor et al., 2000) which is reinforced by the resultant change in the behaviour of others towards the self-injuring individual. For example, others may respond to the behaviour with concern, sympathy, or increased awareness of the seriousness of the self-injuring individual's emotions (Favazza, 1989; Walsh & Rosen, 1988). In this way, NSSI is positively reinforced because the attention, sympathy and concern is rewarding and

pleasing to the individual who engages in NSSI (Favazza, 1989; Feldman, 1988a).

Also, researchers have noted that, in some instances, NSSI may be motivated by secondary gain (Grunebaum & Klerman, 1967; Shore, 1979). Therefore, even if the behaviour is not initially executed as a 'manipulative' strategy, individuals who engage in the behaviour may quickly discover that there are rewarding interpersonal gains associated with the act. Nock and Prinstein (2004) suggested that the processes associated with external motivations may reflect a social positive response (e.g., to get attention) or a negative response (e.g., to avoid punishment from others). It also must be recognised that even if the attention from others is negative or even punishing, any attention received from others may be viewed as better than no attention at all for some individuals who engage in NSSI. In this way, NSSI can be an effective, albeit morbid form of self-help (e.g., Favazza, 2006).

Research also has indicated that NSSI may serve to deliberately arouse a negative response from others. That is, engaging in NSSI may be motivated by a desire for emotional blackmail (Favazza, 1989), to make others feel guilty (Shore, 1979), and to manipulate others into complying with the individual's wishes (Feldman, 1988a). Others may wish to show their anger or displeasure with others (Schwartz et al., 1989; Walsh & Rosen, 1988), or to engage in retaliatory behaviour by 'getting even', which may be more likely to occur in adolescents (Schwartz et al., 1989).

Operant motivations for self-injury generally are more apparent in forensic and psychiatric settings (e.g., Clendenin & Murphy, 1971; Cookson, 1977; Darche, 1990; Deiter et al., 2000; Gough & Hawkins, 2000; Haines, Williams, & Brain, 1995; Hillbrand, Young & Krystal, 1996; Langbehn & Pfol, 1993). This is likely due to a

contribution of limited problem solving skills in these populations (Haines & Williams, 2003), combined with highly controlled environments where individuals do not have much autonomy. Indeed, researchers have suggested that some individuals come to recognise the usefulness of NSSI as a tool for bargaining while in prison or hospital (Walsh & Rosen, 1988).

High incidences of self-injury traditionally have been noted in settings where individuals spend a great deal of time in close contact with each other, such as hospitals and prison (Graff & Mallin, 1967; Podvoll, 1969; Ross & McKay, 1979). Hence, principles of Social Learning Theory may also contribute to the understanding of external motivations for NSSI. In particular, there is now a large body of research evidence which is concerned with contagion effects of NSSI among adolescents in schools (e.g., Nock, 2009; Selekman, 2009; Stone, 1998; Taiminen et al., 1998; Walsh, 2006; Walsh & Rosen, 1988). For adults in community or outpatient samples, however, the effects of contagion and modelling may not be as influential.

Of course, there may be other factors which contribute to the reasons why individuals engage in NSSI. For example, maladaptive cognitions about NSSI and coping, in general, may be influenced by the presence of psychopathology. In addition to the role of BPD on NSSI, it is likely that there are other symptoms and psychiatric disorders which may influence a range of cognitive and motivational factors associated with NSSI. The following section aims to address some of these issues.

Cognitions and psychopathology contributing to NSSI

Axis I or Axis II psychopathology in individuals who engage in NSSI is

common, with one research article indicating that 90% of individuals who engage in NSSI have at least one psychiatric disorder (Haw et al., 2001). Others have suggested that one in five young adults who have engaged in NSSI have psychiatric symptoms that require treatment (Klonsky & Olino, 2008). Other than BPD, the range of commonly occurring disorders include mood disorders (O'Connor, Connery et al., 2000), dissociative disorders (Coons & Milstein, 1990; Shearer, 1994a, 1994b; Zlotnick et al., 1996), eating disorders (Favazza & Conterio, 1989; Paul et al., 2002; Shearer, 1994b; Simpson, 1975), anxiety disorders (Andover et al., 2005; van der Kolk & Fisler, 1995; Zlotnick et al., 1999), and substance abuse (Shearer, 1994a; Simpson, 1995; van der kolk & Fisler, 1995; Zlotnick et al., 1999).

For individuals with BPD, the likelihood of being diagnosed with co-occurring Axis I and Axis II symptomatology is high simply because their needs are complex, and the diagnostic criteria are heterogeneous (Skodol, 2011). In fact, one research article reported that approximately 90% of all individuals with BPD will be diagnosed with at least one other psychiatric condition (Fryer et al., 1988). This means that individuals with BPD have more co-occurring disorders than any other diagnostic group (Zimmerman & Mattia, 1999). If a group of individuals with BPD who were exempt from additional DSM-IV-TR (APA, 2000) diagnoses could be found and become the focus of research attention, this would likely mean that the results would have limited applicability (Rosenthal et al., 2008).

For the approximate 12% of individuals who engage in NSSI but who do not meet the diagnostic criteria for any psychiatric disorder (Nock & Kessler, 2006), it is worth investigating other contributing factors. For example, symptoms or experiences such as anger, impulsiveness, perceived stress or the perception of low

control over emotions could characterise many DSM-IV-TR (APA, 2000) disorders (Watson, 2000), yet they may also occur without the presence of a psychiatric disorder. Additionally, the presence of irrational beliefs or cognitions in individuals who engage in NSSI may help to explain the behaviour.

For example, anger has frequently been associated with NSSI (e.g., Bennum, 1983; Darche, 1990; Gardner & Gardner, 1975; Lloyd-Richardson et al., 2007; Milligan & Andrews, 2005; Raine, 1982). In particular, individuals with BPD are reported to be prone to angry rumination (Selby et al., 2008), aggression and hostility (e.g., Skodol et al., 2002), particularly in the context of impulsivity. This has lead several researchers to suggest that 'impulsive aggression' is a central feature of BPD (Critchfield et al., 2008). However, prevalence of impulsivity can vary substantially among individuals with BPD, depending on the definition and measure used (Critchfield et al., 2008).

The research consistently has indicated that individuals may engage in NSSI in order to cope with high levels of perceived stress (Garrison et al., 1993; Haw & Hawton, 2008; Jovev & Jackson, 2006; Samuels et al., 1994; Williams & McGillicuddy-De Lisi, 2000). This may be related to the dysfunctional belief that engaging in some kind of self-destructive behaviour is the only way to terminate stress (Walsh & Rosen, 1988). Individuals with BPD, in particular, are known to experience a high degree of ongoing stress (Jovev & Jackson, 2006; Linehan, 1993), and to feel that they have little control over their emotions, which is important considering that perceived control of internal states may be just as important as perceived control of external events (Pallant, 2000).

The role of perceived control of internal states appears to have not yet been

examined with specific reference to NSSI. This is surprising given the important implications that perceived control of internal states may have for affect regulation theory. Similarly, learning to tolerate and manage unpleasant emotions as well as controlling these emotions is a core feature of Dialectical Behaviour Therapy (DBT) (Linehan, 1993), which frequently is used in treatment for NSSI with both BPD and NBPD individuals (e.g., Gratz, 2007; Stanley et al., 2007; Walsh, 2006).

According to a diathesis stress model, it is apparent that maladaptive cognitions and beliefs are likely to have a negative impact on an individual's ability to cope with stress. Individuals with high levels of psychological distress are more likely to report significant levels of irrationality (LaPointe & Crandell, 1980). For example, individuals with BPD tend to be rigid in their thinking style, and engage in 'black and white' thinking (Linehan, 1993), as well as a number of cognitive distortions in relation to all or nothing thinking, dependency and unlovability (e.g., Alden & Osti, 1989). In addition, individuals with BPD may be likely to perceive their emotions as externally controlled and to place a great deal of emphasis on the influence of past events (e.g., Arntz et al., 1999; Linehan, 1993).

For individuals without BPD, current understanding about irrational beliefs is somewhat unclear. Although several authors have suggested that it may be important to examine the belief systems of individuals who engage in NSSI (e.g., Simeon & Hollander, 2001; Walsh, 2006; Walsh & Rosen, 1988), there is an absence of research in this area. One research article has made reference to the fact that individuals who engage in NSSI may hold irrational beliefs in terms of overgeneralising and dichotomous thinking and have negative schemas about themselves and the world (Slee et al., 2007). Another study indicated that individuals who engage in NSSI have

maladaptive schemas, and that there were four dysfunctional schemas that distinguished those individuals who do and do not engage in NSSI. Firstly, those who engage in NSSI feel emotionally deprived and believe that there is no one who will provide them with emotional support. Secondly, they have feelings of loneliness that are associated with the belief that one is different from others. Thirdly, they hold beliefs that are associated with feelings of mistrust, that others will hurt, humiliate, or abuse them. Finally, those who engage in NSSI can be distinguished from those who do not engage in the behaviour by the belief that they lack self-control (Castille et al., 2007). However, it appears that there have been no formal investigations of the irrational beliefs held by non personality-disordered individuals who engage in NSSI.

Summary

Individuals may not always have complete insight into the reasons why they engage in NSSI and, of course, any appraisals of motivations may be biased. For example, individuals may simply give socially appropriate responses to questionnaires, or they may retrospectively alter their perceptions about intent as time passes or they recover from the problems that triggered the behaviour (Walsh & Rosen, 1988; Yates, 2004). Some individuals also are simply unable to provide accurate information about their motivations for engaging in NSSI due to a lack of understanding of their own behaviour (Haines, Williams, & Brain, 1995; Walsh & Rosen, 1988), or due to additional difficulties such as alexithymia (Webb & McMurran, 2008).

Nevertheless, the research has indicated that there is a model of affect regulation which can be used to describe NSSI, and it is important to investigate if

factors other than the presence or absence of BPD are likely to influence an individual's decision to engage in NSSI. The research has indicated that there are additional cognitive and symptomatological factors which are likely to serve as motivating factors associated with NSSI. Some of these factors are symptoms associated with specific symptoms (e.g., anger), whereas others are more akin to certain irrational beliefs such as the need to cut to alleviate stress. Further comparison of some of these factors between individuals with and without BPD hopefully will clarify motivations for engaging in NSSI.

Aims and hypotheses

The aim of this study was consider the motivational influences on NSSI for those with and without BPD. In particular, consideration was given to internal and external motivations and cognitions to determine if the presence of BPD has an impact on the reasons why people choose to self-injure. It is evident that people with BPD have additional difficulties with interpersonal communication that are not experienced as intensely by people without BPD (Lieb et al., 2004). These difficulties should influence their motivation for engaging in behaviours that serve to regulate affect because the disturbance in affect may be caused by interpersonal difficulties.

It is expected that:

1. Both BPD and NBPD groups will endorse indicators of internal motivations relating to intropunitive and affect regulation motivations for NSSI on self-report questionnaires.
2. Individuals with BPD will more strongly endorse indicators of external

motivations for NSSI relating to a desire to communicate distress, and a view of NSSI as approach behaviour.

3. Endorsement of these four categories of cognitions (i.e., intropunitive, approach, affect regulation and communication of distress) will be more strongly associated with the NSSI script than the accidental injury or neutral scripts for both groups.
4. Again, the BPD group will be more likely than the NBPD group to endorse cognitions relating to the NSSI imagery script that reflect a desire to communicate distress (e.g., "Unless I hurt myself, no one will know how bad I am feeling).
5. Finally, that these four categories of cognitions relating to NSSI will be endorsed most strongly by both groups during the approach and incident stages of the imagery script.

METHOD

Participants

As for Study 1, a total of 60 participants from the original sample took part in the current study. Demographic details for this study are the same as those for Study 1 (see Tables 2 and 3).

Apparatus and Materials

The same imagery scripts used in Study 1 were used in this study. For the VAS items in this study, a range of cognitions about NSSI taken from the research literature were included to assess cognitive responses to the imagery and will be

introduced in this section (see Appendix H).

In addition, a range of questionnaires chosen to elicit motivational responses to NSSI. Copies of all unpublished scales used in this study are presented in Appendix G.

Psychological tests

Motivation for NSSI

The Motivation for Self-Harm Scale (MFSH, Brain, 1998) was used to assess motivations associated with NSSI. The scale was previously outlined in Chapter 7 as part of Study 2. The MFSH scale was originally used as an assessment tool for examining individual's motivations for attempting suicide (see Henderson et al., 1977), but was adapted by Brain (1998) for use with NSSI. The scale contains 45 items with 8 subscales: *Depression*, *Extrapunitive* (hostility towards others), *Alienation* (feeling unwanted or excluded), *Operant* (used in attempt to alter the behaviour of others), *Modelling* (having recently been exposed to such behaviour by others), *Avoidance* (a temporary escape from an intolerable situation), *Tension Reduction* (seeking to relieve tension or anxiety), and *Janus Face* (ambivalent attitude towards life and death). An *Intropunitive* subscale was added by Brain (1998) to accommodate the reported self-punishment motivations. Items from each of the categories are scored on a three point scale: (1) Not at all; (2) A little; and (3) A great deal, according to the relevance of that item for the individual. Scores from each category range from 5 to 15.

Irrational beliefs

The Belief Scale (Malouff & Schutte, 1986) provides an indication of the individuals' belief system and any irrational beliefs that may contribute to increased stress and/or poor coping. The scale has good internal consistency (.80) and test-retest reliability (.89) and is brief to administer with only 20 items accessing Ellis' (Ellis & Harper, 1975) ten specific irrational beliefs: (1) you must be unfailingly competent and perfect in everything you undertake (2), it is an absolute necessity to have love and approval, (3) when people act unfairly, they are evil, (4) the past has a lot to do with determining the present, (5) emotions are controlled by external events, (6) you should feel fear or anxiety about anything that is unknown, (7) life should be easier/better than it is, (8) it is horrible when things are not the way you want them to be (9) it is better to avoid than face responsibilities, and (10) you need something greater than yourself to rely on. Each irrational belief is assessed with two questions, and participants respond to each question on a five point likert scale. The highest possible score for each of the irrational beliefs is 10, and the lowest is zero.

Perceived control of emotions

The perceived Control of Internal States Scale (PCOIS, Pallant, 2000) was included because the literature recognises that perceived control of internal states may be just as important as perceived control of external events. This scale was developed to provide a measure of the degree to which the individual feels that s/he has control of his/her emotions, thoughts and physical reactions (Pallant, 2000). The scale had good internal consistency (9.2) with a mean inter-item correlation of .41. The scale is more strongly related to adjustment than other existing control measures

(Pallant, 2000).

General Symptomatology and Screening for Axis I and II disorders

The Millon Clinical Multiaxial Inventory – third edition (Millon, 1994) was used as a general measure of the presence of Axis I and Axis II psychopathology based on DSM-IV-TR (APA, 2000) disorders. The inventory is composed of 175 items that are scored to produce 28 scales divided into the following categories: Modifying Indices, Clinical Personality Patterns, Severe Personality Pathology, Clinical Syndromes, and Severe Syndromes. An adjusted weighted score above 75 is suggestive of the presence of a disorder. A score above 85 suggests that the disorder has prominence. The MCMI is often preferred to other inventories due to its brevity, its theoretical anchoring, and interpretive depth (Millon, 1994). Over 600 research studies have used the MCMI inventory to report significant results (Strack & Millon, 2007). Alpha coefficients for the MCMI-III exceed .80 for 20 of the scales, with the highest coefficient of .90 for the Major Depression scale, and a low of .66 for Compulsive personality (Millon, 1994). In addition, the test's manual reported a median of .96 for test-retest reliability, and internal consistency reliabilities are above .80.

Perceived stress

The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) was used to identify general stress symptomatology as perceived stress can be viewed as an antecedent to the presence of psychiatric disorder (Cohen et al, 1983). The scale is favoured as a screening tool due to its brevity as well as substantial

reliability and validity scores. High scores on the PSS have been found to predict depressive symptoms (e.g., Hewitt, Flett, & Mosher, 1992) and health problems such as failure to quit smoking, and greater vulnerability to stressful life events (Cohen et al., 1983). In terms of reliability, coefficients for the PSS range from .84 to .86. Similar scores were noted for samples investigating test-retest reliability (Cohen et al., 1983). Internal consistency reliability has been reported to be .79 (Cohen et al., 1983).

Anger

The State-Trait Anger Expression Inventory-II (STAXI-II; Spielberger, 1999) was used to provide an indicator of state and trait anger levels but also factors such as how the individual reacts and attempts to control anger when s/he is furious. The inventory contains items which measure state anger (*how I feel right now)*, trait anger (*how I generally feel*) and anger expression (*how do I generally react or behave when angry or furious*) on a four-point scale, from one (*almost never*) to four (*almost always*) with higher scores indicating a higher degree of anger. The range of scores is from 10 to 40 on each scale. Internal consistency reliability has values ranging from .73 to .95 for the total scale and from .73 to .93 for the subscales, and the items correlate well with other anger inventories (Spielberger, 1999).

Impulsiveness, venturesomeness and empathy

The Eysenck Impulsiveness Questionnaire (Eysenck & Eysenck, 1978) was used to provide a general indicator of impulsivity as well as empathy and venturesomeness between the two groups. Three subscales are derived from the 63

items of this questionnaire. The *Venturesomeness* subscale is designed to measure thrill and adventure seeking and risk taking tendencies as part of 'normal' impulsivity, the *Impulsiveness* subscale is designed to assess disinhibition, non-planning and boredom susceptibility, and the *Empathy* subscale was included to determine individuals' emotional response to the perceived emotional experience of others.

Data from the original sample indicated mean scores of 10 for impulsiveness and venturesomeness and a mean score of 13 for the empathy subscale for normal participants (Eysenck & Eysenck, 1978). Factor analysis demonstrated the distinctiveness of each of the three subscales. In addition, satisfactory alpha reliability coefficients were indicated for each subscale ranging from .64 for females for the empathy subscale to .85 for males for the impulsiveness subscale (Eysenck & Eysenck, 1978). A previous study with a BPD group demonstrated means of 10.35 for impulsiveness, 6.74 for venturesomeness and 15.10 for empathy (Cottraux et al., 2009). The internal consistency of the scale is generally adequate, with one study reporting an alpha of .69 (Vitaro, Arseneault, & Tremblay, 1997).

Suicidal ideation and beliefs

The Reasons for Living Inventory-48 (RFL-48; Linehan, Goodstein, Nielsen, & Chiles, 1983) was used to identify participants' reasons for not engaging in suicidal behaviour. This scale asks the individual to identify the reasons that s/he may have for not engaging in suicidal behaviour that may be accessed in times of crisis. It is designed to emphasise the adaptive characteristics which may be lacking in the suicidal individual rather than identifying maladaptive characteristics. Listed

are 48 reasons not to commit suicide and participants are asked to rate how important these reasons would be to them if they were thinking about killing themselves. Ratings are made on a 6 point scale ranging from 1 = not at all important as a reason, to 6 = an extremely important reason not to kill oneself. An average score is then obtained for the 6 subscales of the RFL-48. Three of the subscales are designed to assess positive factors concerned with reasons to continue living (*Survival and Coping*, *Responsibility to Family*, and *Child Related Concerns*). Other subscales are designed to measure specific negative expectations concerning the consequences of suicidal behaviour (*Fear of Suicide*, *Fear of Social Disapproval* and *Moral Objections to Suicide*).

Estimates of internal consistency were computed for each subscale separately. Alpha coefficients ranging from .72 to .89 indicated moderately high internal reliability for the subscales of the RFL-48. Significantly lower scores for the *Survival and Coping Beliefs*, *Responsibility to Family*, *Child-Related Concerns*, and *Moral Objection* subscales have effectively distinguished participants with history of parasuicide from nonsuicidal psychiatric patients. In addition, significantly lower scores for the *Survival and Coping* scale, the *Responsibility to Family*, and *Child Related Concerns* scales distinguished participants with current suicidal ideation from nonsuicidal control participants. Research also has demonstrated that scores for the *Survival and Copin*g scale, and *Responsibility to Family* subscales correlated negatively with independent measures of depression (Linehan et al., 1983).

Cognitions about NSSI

Visual Analogue Scales

Visual Analogue Scales (VAS) were used to assess strength of endorsement of NSSI related cognition to each of the three imagery scripts. These included *I view the event as positive* and *I like to hurt myself* (assessment of approach response to self-injury), *I hate myself* and *I'm a bad person so I have to engage in this behaviour* (intropunitiveness and self-punishment motivations), *I can't stand this any longer* and *I need to engage in this behaviour to relax* (affect regulation/tension reduction motivations), and *I need to do something drastic so that people will understand how I'm feeling* and *unless I engage in this behaviour, no-one will know how terrible I feel* (motivations associated with the communication of distress). These cognitions were based on determination of the cognitions associated with NSSI from review of the existing literature.

Procedure

As outlined in Study 1, participants were interviewed about an incident of NSSI, an accidental injury, and a neutral event, and imagery scripts were created and administered to the participants while psychophysiological measurements were taken. VAS items specifically relating to the participants' cognitive responses to the imagery were administered with this first study. In addition, questionnaires relating to cognitions and motivations about NSSI, in addition to measures assessing psychopathology were included in the questionnaire package. Participants completed this questionnaire package outside of the laboratory session.

RESULTS

Cognitions about NSSI

Group differences

Group (BPD, NBPD) x script (NSSI, accidental injury, neutral) x stage (scene, approach, incident, consequence) ANOVAs were conducted for each of the cognitive VAS measures to determine if there were any differences in the groups' endorsement of the cognitions in response to the imagery. There were no significant script x stage x group interactions for any of the cognitive items. However, the item *I need to do something drastic, so that people will understand how I'm feeling* was approaching significance (p = .06). Means and standard deviations for each stage of each script for BPD and NBPD groups are presented in Appendix I.

Despite the fact that there were no significant group x script x stage interactions, there were script x group interactions observed for the cognitive VAS items, *I like to hurt myself,* $F(2,116) = 3.7$, $MSE = 6707.7$, $p<.03$, and *to show how terrible I feel,* $F(2,116) = 4.3$, $MSE = 7050.6$, $p<.02$. The BPD group were more likely to endorse the fact that they liked to hurt themselves during the NSSI script than the NBPD group. The BPD group were also more likely than the NPD to feel the need to hurt themselves to show how terrible they were feeling during the NSSI script. For both groups, the need to show how terrible they were feeling was apparent during the NSSI script, but not for the accidental injury or neutral scripts. Post hoc analyses are presented in Tables 22, 23 and 24. Descriptive statistics are presented in Appendix I

Table 22

Post hoc analyses for group x script interactions for the cognitive VAS item I like to hurt myself

Script	**df**	***F***	***MSE***	***p***	**Fisher's LSD**	**Differences**
NSSI	1, 58	4.6	991.9	<.04	16.3	BPD>NBPD
Accidental Injury	1, 58	0.1	537.6	ns		
Neutral	1, 58	0.1	231.3	ns		

Table 23

Post hoc analyses for group x script interactions for the cognitive VAS item to show how terrible I feel

Script	**df**	***t***	***p***	**Differences**
NSSI	58	2.0	<.05	BPD>NBPD
Accidental injury	58	.05	ns	
Neutral	58	1.4	ns	

Table 24

Across script post hoc analyses for BPD and NBPD groups for the cognitive VAS item to show how terrible I feel

Group	**df**	***F***	***MSE***	***p***	**Fisher's LSD**	**Differences**
BPD	2, 58	32.8	17025.0	<.0001	11.8	NSSI>AI,N
NBPD	2, 58	16.9	5071.4	<.0001	8.9	NSSI>AI,N

Next, consideration was given to script by stage interactions. Means and standard deviations for each stage of each script are presented in Appendix I. There were significant script by stage interactions for the cognitive items of *I view the event as positive*, $F(6, 348) = 28.2$, $MSE = 14474.5$, $p<.0001$, *I like to hurt myself*, $F(6, 348) = 7.2$ $MSE = 888.7$, $p<.0001$, *I can't stand this any longer,* $F(6, 348) = 14.6$, $MSE = 5318.7$, $p<.0001$, *I need to hurt myself in order to relax*, $F(6, 348) = 10.4$, $MSE = 2833.3$, $p<.0001$, *I need to do something drastic, so that people will understand how I'm feeling*, $F(6, 348) = 3.1$, $MSE = 584.3$, $p<.006$, and *Unless I hurt myself, no one will know how terrible I feel,* $F(6, 348) = 5.8$, $MSE = 1098.5$, $p<.0001$. These results are presented below in Figure 10.

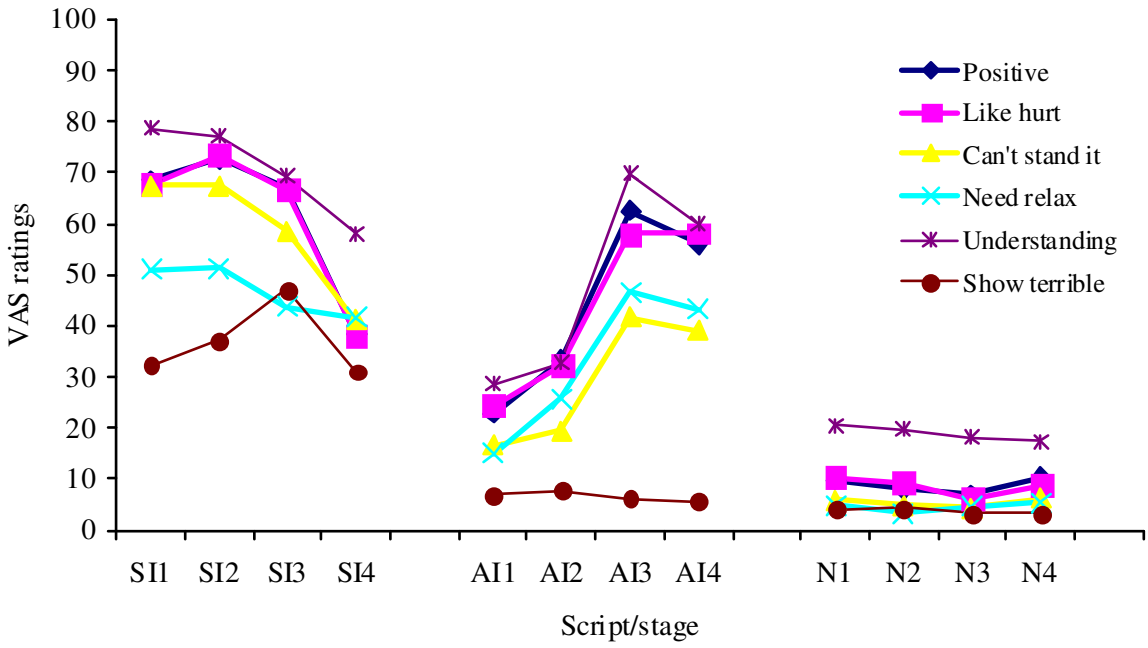


Figure 10. Script x stage interactions for cognitive VAS items

Consideration was then given to the script differences at each stage. The means and standard deviations are presented in Appendix I. Post hoc analyses are presented in Table 25.

Table 25

The post hoc analysis results for script differences at each stage for cognitive VAS items for BPD and NBPD groups

Cognitive VAS Item	Stage	df	*F*	*MSE*	*p*	Fisher's LSD	Differences
View +ve	Scene	2, 118	95.2	56101.5	<.0001	8.8	NSSI<AI,N
	Approach	2, 118	74.3	52686.0	<.0001	9.6	NSSI<AI,N AI<N
	Incident	2, 118	76.6	56316.7	<.0001	9.8	NSSI,AI<N
	Consequence	2, 118	37.7	31910.3	<.0001	10.5	NSSI,AI<N
Like hurt	Scene	2, 118	47.1	26202.8	<.0001	8.5	NSSI>AI,N
	Approach	2, 118	60.4	34372.5	<.0001	8.6	NSSI>AI,N
	Incident	2, 118	91.0	51606	<.0001	8.6	NSSI>AI,N
	Consequence	2, 118	52.9	29914.4	<.0001	8.6	NSSI>AI,N
Can't stand it	Scene	2,118	87.2	62086	<.0001	9.6	NSSI>AI,N
	Approach	2,118	153.6	78885.4	<.0001	8.2	NSSI>AI,N
	Incident	2,118	82.8	63393.9	<.0001	10.0	NSSI>AI,N AI>N
	Consequence	2,118	35.3	28127.9	<.0001	10.2	NSSI>AI,N AI>N
Need relax	Scene	2, 118	37.7	24415.5	<.0001	9.2	NSSI>AI,N
	Approach	2, 118	52.7	38726.7	<.0001	9.8	NSSI>AI,N
	Incident	2, 118	132.7	75116.2	<.0001	8.6	NSSI>AI,N
	Consequence	2, 118	60.8	31628.6	<.0001	8.2	NSSI>AI,N
Understand.	Scene	2, 118	26.3	16885.2	<.0001	9.2	NSSI>AI,N
	Approach	2, 118	31.2	20246.5	<.0001	9.2	NSSI>AI,N
	Incident	2, 118	35.3	27427.5	<.0001	10.1	NSSI>AI,N
	Consequence	2, 118	22.6	12301.1	<.0001	8.4	NSSI>AI,N

Terrible	Scene	2, 118	25.0	14515.4	<.0001	8.7	NSSI>AI,N
	Approach	2, 118	31.0	19640.9	<.0001	9.1	NSSI>AI,N
	Incident	2, 118	61.6	36150.6	<.0001	8.8	NSSI>AI,N
	Consequence	2, 118	29.3	14323.6	<.0001	8.0	NSSI>AI,N

Note: results for I'm bad, and I hate myself were non-significant so are not included here

For the ratings of cognitive response to imagery, the NSSI script elicited a lower tendency to *view the event as positive* as did the accidental injury and neutral scripts at the scene and approach stages. The NSSI and accidental injury scripts also were viewed less positively than the neutral script during the incident and consequence stages. In terms of endorsing the view *I like to hurt myself,* the NSSI elicited greater endorsement of this view than the accidental injury and neutral scripts, at all stages of the script. For the view *I can't stand this any longer*, the NSSI script was again associated with greater endorsement of this view than the accidental injury and neutral scripts at all stages. Participants also indicated stronger ratings of this view during the accidental injury script than the neutral script at the incident and consequence sages.

The views *I need to engage in this behaviour to relax, I need to do something drastic so that people will understand how I'm feeling*, and *unless I engage in this behaviour, no one will know how terrible I feel* were all significantly more likely to be endorsed for the NSSI script than for the accidental injury and neutral scripts. This was apparent for all stages of the scripts.

Across stage changes were then considered. Means and standard deviations are presented in Appendix I.

Table 26

The post hoc analysis results for across stage changes for each script for the BPD and NBPD groups for cognitive VAS items

Cognitive VAS Item	Script	df	*F*	*MSE*	*p*	Fisher's LSD	Differences
View +ve	NSSI	3, 177	11.6	6125.2	<.0001	8.3	1,2,3<4
	AI	3, 177	40.9	29699.1	<.0001	9.7	1,2>3,4 3<4
	N	3, 177	1.1	209.7	ns		
Like hurt	NSSI	3, 177	7.7	2241.8	<.0001	6.1	1,2<3 3>4
	AI	3, 177	0.2	13.4	ns		
	N	3, 177	6.3	183.9	<.0004	1.9	1>2,3,4
Can't stand it	NSSI	3, 177	16.8	7625.1	<.0001	7.7	1,2,3>4
	AI	3, 177	7.9	4876.4	<.0001	8.9	1,2<3,4
	N	3, 177	2.8	127.4	ns		
Need relax	NSSI	3, 177	13.7	5979.2	<.0001	7.5	1<2,3 2<3 2>4 3>4
	AI	3, 177	2.7	787.5	<.0001	6.1	2>3
	N	3, 177	2.6	282.3	ns		
Understand.	NSSI	3, 177	6.2	1918.6	<.0005	6.4	1<3 2,3>4
	AI	3, 177	0.8	159.3	ns		
	N	3, 177	2.0	34.3	ns		

Terrible	NSSI	3, 177	9.4	3163.8	<.0001	6.6	1,2<3 3>4
	AI	3, 177	0.3	45.4	ns		
	N	3, 177	2.0	22.6	ns		

Note: Results for I'm bad, and I hate myself were non-significant so are not included here

When cognitive reactions to NSSI were considered, the tendency to *view the event as positive* received less endorsement at the scene, approach and incident stages than at the consequence stage. For the accidental injury script, the tendency to view the event as positive was rated higher during the scene and approach stages than it was at the incident and consequence stage, although the incident stages was viewed less positively than the consequence stage. For the view *I like to hurt myself*, the scene and approach stages of the NSSI script were less likely to be associated with a like for hurting oneself than the incident and consequence stages, but endorsement of this view was higher during the incident stage than it was for the consequence stage. Unusually, the neutral script was also associated with the view *I like to hurt myself*, in that participants endorsed this view more highly in the scene stage than they did for the approach, incident and consequence stages.

For the view *I can't stand this any longer*, the NSSI script was associated with higher ratings at the scene, approach and incident stages than it was for the consequence stage. The scene and approach stages of the accidental injury script were also associated with lower ratings of *I can't stand this any longer* than the incident and consequence stages. For the view, *I need to engage in this behaviour to relax*, the scene stage of the NSSI script was less associated with less need to relax than the approach and incident stages, and the approach stage was rated lower than

the incident stage. However, the approach and incident stages both were associated with greater need to relax than the consequence stages. Interestingly, the accidental injury script was also associated with a greater need to relax at the approach stage than for the incident stage.

For the view, *I need to do something drastic so that people will understand how I'm feeling,* the scene stage of the NSSI script was associated with less need for understanding than the incident stage of the script. However, the approach and incident stages were rated higher for need for understanding than the consequence stage. Finally, the view *unless I engage in this behaviour, no one will know how terrible I feel*, was less strongly endorsed during the scene and approach stages of the NSSI script than for the incident stage, yet the incident stage was associated with higher need to show how terrible participants were feeling than the consequence stage.

There was a script main effect for the cognitive VAS items *I hate myself*, $F(2,116) = 106.0$, $MSE = 199793.3$, Fisher's LSD = 7.9 = $p<.0001$, where the NSSI script elicited higher ratings than the accidental injury and neutral scripts, and in addition, the accidental injury script elicited higher ratings than the neural script. There was also a main effect for the item *I'm bad*, $F(2,116) = 52.7$, $MSE = 91122.5$, Fisher's LSD = 7.6, $p<.0001$, where the NSSI script elicited a higher rating than the accidental injury or neutral scripts.

Psychopathology

Beliefs

The Belief Scale (Malouff & Schutte, 1986) was used to examine 'irrational'

beliefs which may contribute to increased stress and/or poor coping in individuals. The BPD group endorsed the following four irrational beliefs to a significantly greater extent than the NBPD group: *the past determines current feelings and behaviours*, $t(55) = 2.2$, $p<.04$, *I must be anxious when there is a risk of danger,* $t(55) = 2.1$, $p<.04$, *life should be easier than it is,* $t(55) = 3.0$, $p<.004$, and *it's awful to be treated unfairly,* $t(54) = 2.5$, $p<.02$. Descriptive statistics are presented in Table 27.

Table 27

Belief Scale scores for BPD and NBPD groups

Belief		**Group**	
		BPD	**NBPD**
Must always be competent	M	7.9	7.5
	SD	1.9	2.1
Must have approval	M	8.0	7.5
	SD	1.9	2.1
Certain people are evil	M	6.2	5.1
	SD	2.4	2.4
Past influences emotions	M	6.9	5.4
	SD	2.5	2.6
Emotions are externally controlled.	M	7.3	6.9
	SD	1.6	1.6
should be anxious in case of danger	M	7.9	6.8
	SD	2.0	1.8
Life should be easier	M	7.5	6.1
	SD	1.7	1.8
Awful to be treated unfairly	M	7.2	5.8
	SD	1.9	2.4
Better to avoid responsibilities	M	4.7	4.4
	SD	1.9	1.8
Hate uncertainty	M	8.6	8.0
	SD	1.6	1.7

Anger

The STAXI-II (Spielberger, 1999) was used to examine group differences in regards to three domains of anger: state anger (the experience of anger felt during completion of the inventory), trait anger (the individual's general predisposition towards anger), and anger control. There were no group differences in terms of state

anger. However, there were significant differences between BPD and groups in each of the areas of trait anger that the STAXI-II assesses. Firstly, the BPD group demonstrated higher levels of trait anger overall, $t(56) = 3.7$, $p<.0004$. The *T-Ang/T* subscale measures whether individuals have an overall angry temperament, and the *T-Ang/R* subscale measures whether people tend to respond with anger when they feel they have been treated unfairly or criticised (Spielberger, 1999). The BPD group were significantly more likely than the group to have both an angry temperament, $t(56) = 2.9$, $p<.006$, and to respond to perceived slights with anger, $t(56) = 2.5$, $p<.02$. Secondly, there were important differences between the groups in terms of the expression and control of anger.

The BPD group were significantly more likely to express their anger outwardly (*AX-O*), $t(56) = 2.2$, $p<.04$, by means of assaulting others, destroying objects, and being verbally aggressive (Spielberger, 1999). In contrast, the group were significantly more likely than the BPD group to work hard to try and control their anger from being outwardly expressed (*AC-O*), $t(56) = 2.4$, $p<.02$. In addition, they were also more likely to try to use strategies such as taking a deep breath, to try to calm themselves if they became angry (*AC-I*), $t(56) = 2.4$, $p<.03$. Descriptive statistics are presented below in Table 28.

Table 28

STAXI-II scores for BPD and Non-BPD groups

STAXI-II Scale		**Group**	
		BPD	**NBPD**
State anger			
S-Ang	M	23.2	19.6
	SD	7.7	8.2
S-Ang/F	M	8.8	7.6
	SD	3.0	4.5
S-Ang/V	M	7.3	6.8
	SD	3.7	3.0
S-Ang/P	M	6.7	5.8
	SD	1.9	2.3
Trait anger			
T-Ang	M	24.0	17.9
	SD	6.4	6.0
T-Ang/T	M	8.5	6.2
	SD	3.3	2.9
T-Ang/R	M	10.8	8.8
	SD	2.9	3.1
AX-O	M	17.8	15.1
	SD	5.3	4.3
AX-I	M	21.8	19.4
	SD	4.3	5.2
AC-O	M	21.1	24.4
	SD	5.9	4.3
AC-I	M	18.9	22.2
	SD	5.9	4.4
AX Index	M	47.8	35.9
	SD	14.2	12.8

Impulsivity, venturesomeness and empathy

The Eysenck Impulsiveness Questionnaire (Eysenck & Eysenck, 1978) was used to determine group differences on impulsiveness, venturesomeness and empathy. There was a significant difference for impulsiveness, whereby the BPD group were more impulsive than the group, $t(56) = 4.1$, $p<.0001$. Descriptive statistics are presented in Table 29.

Table 29

Eysenck Impulsivity Scale scores for BPD and NBPD groups

EIS Scale		**Group**	
		BPD	**NBPD**
Impulsiveness	M	13.4	8.9
	SD	4.4	4.1
Venturesome	M	10.6	8.8
	SD	3.7	5.1
Empathy	M	15.4	14.4
	SD	4.1	3.3

Perceived stress

The mean perceived stress score for the BPD group was 26.4 ($SD = 4.6$), and the mean score for the NBPD group was 20.9 ($SD = 5.4$). A comparison of the two groups indicated that the BPD group demonstrated significantly higher levels of perceived stress than NBPD participants, $t(56) = 4.2$, $p<.0001$.

Perceived emotional control

In terms of perceived control of emotions, the score for the BPD group was 41.3 (*SD* = 12.6), and the mean score for NPD the group was 54.2 (*SD* = 12.7). A comparison of the two groups indicated that the BPD group demonstrated significantly lower levels of perceived control over their emotions than the participants, $t(37) = 3.2$, $p<.003$. It should be noted that there were fewer participants who completed the PCOIS (Pallant, 2000) because this instrument was included after pilot testing.

Suicidal ideation and beliefs

The RFL-48 (Linehan et al., 1983) was included here to determine any differences between the groups in relation to specific beliefs related to suicide. There was a significant group difference for *survival* beliefs, whereby the NBPD group were more likely to endorse this as a reason for not committing suicide, $t(53) = 2.3$, $p<.03$. There were no other significant differences for this scale (see Table 30 for descriptive statistics).

Table 30

RFL-48 scores for BPD and NBPD groups

Reason for Living		**Group**	
		BPD	**NBPD**
Survival	M	3.4	4.1
	SD	1.2	1.1
Responsibility	M	4.4	4.4
	SD	1.2	1.3
Children	M	3.0	2.3
	SD	1.9	1.6
Fear suicide	M	2.9	2.7
	SD	1.2	1.3
Fear social	M	2.8	3.0
	SD	1.5	1.6
Moral reasons	M	1.9	2.2
	SD	1.4	1.4
Mean	M	3.2	3.6
	SD	0.9	0.8
Total	M	156.2	170.5
	SD	42.3	37.5

Motivations for NSSI

The Motivation for Self-Harm Scale (Brain, 1998) was used to examine group differences in motivations for engaging in NSSI. There was a significant group difference for the *extrapunitive* motivation, whereby individuals with BPD endorsed this motivation more strongly than did the NBPD group, $t(55) = 2.2$, $p<.04$. In addition, the *operant* motivation was endorsed more strongly by the BPD group than it was by the NBPD group, $t(55) = 2.3$, $p<.03$. There were no other significant results

(see Table 31 for descriptive statistics).

Table 31

Motivation for Self-Harm (MFSH) descriptive statistics

Motivations		**Group**	
		BPD	**NBPD**
Depression	M	12.0	11.2
	SD	2.0	2.4
Extrapunitive	M	10.0	8.3
	SD	3.2	2.6
Alienation	M	11.3	11.1
	SD	2.9	2.4
Operant	M	9.9	8.0
	SD	3.2	3.0
Modelling	M	7.9	7.8
	SD	2.2	2.3
Avoidance	M	11.2	10.3
	SD	2.4	2.6
Tension Red.	M	11.9	11.7
	SD	2.1	2.2
Janus Face	M	10.4	10.1
	SD	3.0	3.1
Intropunitive	M	11.0	10.2
	SD	3.0	3.7

Additional Axis I and II disorders

As mentioned previously, it was important to consider the impact of comorbidity in both BPD and NBPD groups. This was addressed by considering the clinical syndromes derived from the MCMI-III (Millon, 1994). A score above 75

indicates the likelihood of a disorder and, in addition a score above 85 indicates that the disorder has prominence (Millon, 1994).

Firstly, consideration was given to personality scales from the MCMI-III, to provide an indication of possible Axis II psychopathology. Schizotypal, Borderline and Paranoid Personality Disorders are considered 'severe' personality scales on the MCMI-III. Mean adjusted scores and post hoc analyses for all subscales are presented in Appendix I. The NBPD group did not obtain any significant results for Axis II psychopathology. For the BPD group, there were significant results for a few Axis II disorders, but none of them are currently included as major disorders, and appear in the appendices of the DSM-IV-TR (APA, 2000). The only exception was for Borderline Personality Disorder, χ^2 (2, N = 58) = 37.1, p<.0001, which naturally was associated with inflated scores for the BPD group. Significant results were found for the following personality disorders: Sadistic, χ^2 (2, N = 58) = 6.5, p<.04, Negativistic (passive-aggressive), χ^2 (2, N = 58) = 9.3, p<.01, and Masochistic χ^2 (2, N = 58) = 10.2, p<.007.

Next, clinical syndromes were analysed. The mean adjusted scores and post hoc analyses for all subscales are presented in Appendix I. Thought Disorder, Major Depression and Delusional Disorder are considered 'severe' clinical syndromes on the MCMI-III. Interestingly there were no significant results apart from those for thought disorder, χ^2 (2, N = 58) = 9.3, p<.01, which was completely absent from the NBPD group. Percentages indicating the extent of personality and clinical syndromes experienced by BPD and NBPD are demonstrated in Tables 32 and 33.

Table 32

Percentages of participants experiencing personality pathology (Axis-II) in BPD and NBPD groups from the MCMI-III

Personality Scales	**Cut-off score**	**Group**	
		BPD	**NBPD**
Schizoid	<75	82.8	79.3
	75+	6.9	17.2
	85+	10.3	3.4
Avoidant	<75	55.2	75.9
	75+	20.7	17.2
	85+	24.1	6.9
Depressive	<75	41.4	51.7
	75+	13.8	24.1
	85+	44.8	24.1
Dependent	<75	48.3	75.9
	75+	17.2	6.9
	85+	34.5	17.2
Histrionic	<75	89.7	89.7
	75+	6.9	3.4
	85+	3.4	6.9
Narcissistic	<75	82.8	89.7
	75+	6.9	3.4
	85+	10.3	6.9
Antisocial	<75	65.5	79.3
	75+	20.7	20.7
	85+	13.8	0.0
Sadistic	<75	72.4	96.5
	75+	3.4	0.0
	85+	24.1	3.4
Compulsive	<75	100	93.1
	75+	0.0	6.9
	85+	n/a	n/a

Negativistic	<75	44.8	82.8
	75+	41.4	10.3
	85+	13.8	6.9
Masochistic	<75	34.5	75.9
	75+	34.5	10.3
	85+	31.0	13.8
Schizotypal	<75	89.7	93.1
	75+	3.4	0.0
	85+	6.9	6.9
Borderline	<75	13.8	93.1
	75+	48.3	6.9
	85+	37.9	0.0
Paranoid	<75	75.9	93.1
	75+	13.8	3.4
	85+	10.3	3.4

Table 33

Percentages of participants experiencing clinical syndromes (Axis-I) in BPD and NBPD groups from the MCMI-III

Clinical syndrome	**Cut-off score**	**Group**	
		BPD	**NBPD**
Anxiety	<75	6.9	31.0
	75+	55.2	34.5
	85+	37.9	34.5
Somatoform	<75	86.2	79.3
	75+	10.3	10.3
	85+	3.4	10.3
Bipolar	<75	58.6	82.8
	75+	6.9	3.4
	85+	34.5	13.8
Dysthymia	<75	65.5	69.0
	75+	34.5	24.1
	85+	0.0	6.9
Alcohol	<75	75.9	82.8
	75+	10.3	10.3
	85+	13.8	6.9
Drug	<75	79.3	82.8
	75+	0.0	6.9
	85+	20.7	10.3
PTSD	<75	79.3	86.2
	75+	10.3	3.4
	85+	10.3	10.3
Thought disorder	<75	72.4	100
	75+	13.8	0.0
	85+	13.8	0.0
Major Depression	<75	55.2	79.3
	75+	13.8	3.4
	85+	31.0	17.2
Delusional Disorder	<75	86.2	93.1
	75+	3.4	3.4
	85+	10.3	3.4

Looking at all of the mean scores (i.e., including those less than 75) for both groups on clinical and personality syndromes on the MCMI-III, it was apparent that the BPD group had significantly higher scores than the NBPD group on almost every subscale, including: Dependent, Antisocial, Sadistic, Negativistic, Masochistic, Schizotypal, Borderline, Paranoid, Anxious, Bipolar, Dysthymic, Alcohol, PTSD, Thought Disorder, Major Depression, and Delusional Disorder (see Table 34 for descriptive statistics).

Table 34

Mean group scores on the MCMI-III (including scores below 75)

MCMI-III Subscale		**Descriptives**	
		M	**SD**
Schizoid	BPD	59.3	20.2
	NBPD	57.3	25.8
Avoid	BPD	70.7	21.7
	NBPD	59.0	24.1
Depressive	BPD	77.0	19.3
	NBPD	65.4	27.7
Dependent	BPD	71.6	21.1
	NBPD	51.2	25.4
Histrionic	BPD	43.6	24.0
	NBPD	45.6	22.9
Narcissistic	BPD	54.4	26.9
	NBPD	55.0	19.5
Antisocial	BPD	67.9	18.1
	NBPD	53.2	22.6
Sadist	BPD	70.9	14.8
	NBPD	48.8	22.4

Compulsive	BPD	31.6	16.5
	NBPD	50.2	16.1
Negativistic	BPD	72.9	16.3
	NBPD	47.0	26.8
Masochistic	BPD	77.2	15.1
	NBPD	51.6	30.8
Schizotypal	BPD	68.4	8.4
	NBPD	54.9	18.0
BPD	BPD	81.7	14.6
	NBPD	54.9	18.0
Paranoid	BPD	65.9	16.6
	NBPD	47.0	28.7
Anxious	BPD	82.2	10.0
	NBPD	66.5	30.1
Somatic	BPD	60.3	17.5
	NBPD	53.1	27.3
Bipolar	BPD	77.8	19.7
	NBPD	59.2	26.0
Dysthymic	BPD	64.1	16.7
	NBPD	43.7	35.4
Alcohol	BPD	66.5	20.3
	NBPD	50.3	28.1
Drugs	BPD	64.8	23.7
	NBPD	56.9	23.8
PTSD	BPD	68.2	15.5
	NBPD	56.2	26.9
Thought Dis.	BPD	68.0	15.7
	NBPD	47.1	22.1
Depression	BPD	69.9	20.6
	NBPD	50.2	32.4
Delusional	BPD	55.1	26.3
	NBPD	34.7	32.2

In terms of clinical significance, participants with BPD obtained two mean scores for Axis I disorders that were significantly different to the NBPD group, including anxiety (M = 82.2, SD = 10.0), and Bipolar Disorder (M = 77.8, SD = 19.7). Post hoc analyses are presented in Appendix I

For Personality pathology, it was noted that the BPD group obtained an inflated score for Depressive personality (M = 77, SD = 19.3), however this score was not significantly different to the NBPD group. Again, only the Sadistic, Negativistic, Masochistic, and Borderline scales reached clinical significance in terms of Millon's (1994) criterion.

The only subscale on which the NBPD group had a significantly higher mean score than the BPD group was for Compulsive personality patterns. However, this score was still well below the cut-off point for it to be clinically meaningful (M = 50.2, SD = 16.1).

DISCUSSION

The aim of this study was consider the motivational influences on NSSI for those individuals with and without BPD. In particular, consideration was given to internal and external motivations and cognitions to determine if the presence of BPD has an impact on the reasons why people choose to self-injure. It firstly was expected that both BPD and NBPD groups would endorse indicators of internal motivations relating to intropunitive and affect regulation motivations for NSSI on self-report questionnaires. Secondly, it was expected that those individuals with BPD would more strongly endorse indicators of external motivations for NSSI relating to a desire to communicate distress, and a view of NSSI as an approach behaviour. Thirdly, it

was anticipated that endorsement of these four categories of cognitions (i.e., intropunitive, approach, affect regulation and communication of distress) would be more strongly associated with the NSSI script than the accidental injury or neutral scripts for both groups. Again, it was expected that the BPD group would be more likely than the NBPD group to endorse cognitions relating to the NSSI imagery script that reflect external motivations (e.g., "Unless I hurt myself, no one will know how bad I am feeling"). Finally, it was anticipated that these cognitions relating to NSSI, either internal or external would be endorsed most strongly by both groups during the approach and incident stages of the imagery script

Intropunitive and affect regulation motivations for NSSI

Consistent with the first hypothesis, it was apparent that internal motivations associated with NSSI were endorsed by both BPD and NBPD groups. The cognitions *I can't stand this any longer*, and *I need to engage in this behaviour to relax* can be viewed as related to tension-reducing motivations, and the desire to control one's internal state. The NSSI script was associated with higher ratings of the cognition *I can't stand this any longer* than it was for the accidental injury and neutral scripts at all four stages. This response mirrors the psychological ratings of anxiety and tension that were evidenced in Study 1. The first three stages of the NSSI script also were associated with higher ratings of *I can't stand this* than the consequence stage, which further demonstrates evidence for the tension-reducing properties of NSSI (e.g., Brain et al., 1998a, 1998b, 2002; Haines, Williams, & Brain, 1995).

In addition, the fact that participants gave higher ratings for *I can't stand this* during the incident and consequence stages of the accidental injury script than they

did for the neutral script makes sense, as these stages were associated with tension, fear and anxiety associated with sustaining an injury. These results are consistent with previous research findings, which have indicated that individuals who engage in NSSI experience tension and anxiety in response to non-deliberate injuries in the same way as healthy controls, and that they are not stimulated by these types of accidental and painful injuries (e.g., Brain, 1998; Brain et al., 1998a, 1998b, 2002; Haines, Williams, & Brain, 1995; Haines, Williams, & Brain et al., 1995).

For the cognition, *I need to engage in this behaviour to relax,* it was evident that engaging in NSSI was more strongly associated with the need to relax than the accidental and neutral scripts, at all four stages of the scripts. The scene stage of the NSSI script was associated with less need to relax than the approach and incident stages, which evidences both the increasing psychological and physical tension seen in Study 1. This urge to engage in NSSI to relax was weaker in the consequence stage than it was for the approach and incident stages, which perhaps is an indication that relaxation was achieved by this point. Previous research has indicated that for individuals who engage in NSSI, relaxation and reduced tension are strongly motivating factors for the behaviour (Brain et al., 1998a, 1998b, 2002; Chapman & Dixon-Gordon, 2007; Haines, Williams, & Brain, 1995; Kemperman et al., 1997).

Interestingly, the accidental injury script was associated with a greater need to relax at the approach stage than it was for the incident stage. The reasons for this are not immediately clear, however, there were a number of participants who identified sports injuries for this script. One explanation, then, might be that the approach stage was reflecting participants' need to relax by engaging in physical activity (e.g., by going for a bike ride or a run), which would have been achieved had the participants

not then injured themselves. Similarly, there were many participants who relayed incidents at work where they injured themselves in circumstances where they were under pressure to quickly chop up food or fix objects. In this way, the 'need to relax' may have been driven by the urgency to perform the task (e.g., "I need to get this done so that I can relax").

Alternatively, it may have been the case that when participants knew that they were facing an imminent injury during the imagery script, they were able to instruct themselves to relax in an effort to avoid thinking about the injury. Research has previously identified that individuals who engage in NSSI may have strong needs for experiential avoidance, and this may be particularly true during situations in which the individual has little control (e.g., Chapman et al., 2006). Engaging in strategies such as cued relaxation may have assisted participants in avoiding potentially unpleasant responses associated with not being in control.

The cognitive items *I'm a bad person, so I have to engage in this behaviour,* and *I hate myself,* carry themes of intropunitiveness and negative view of self. The research literature consistently has indicated that individuals who engage in NSSI have poor self-esteem and experience cognitive distortions (Hawton et al., 2002; Klonsky & Muehlenkamp, 2007; Muehlenkamp & Gutierrez, 2007), which can lead individuals to see NSSI as a means of self-punishment (e.g., Gratz et al., 2002; Laye-Gindhu et al., 2005; Skegg, 2005). There were no significant group or script x stage interactions for these items. What was demonstrated was a main effect whereby the cognition *I hate myself* was more prominent in the NSSI script than it was for the accidental injury or neutral scripts. This view also was more prominent during the accidental injury script than it was for the neutral script, which may be a reflection of

the participants' anger and frustration in response to injuring themselves. It also may be the case that as a group, the participants experienced regular and frequent negative cognitive distortions about themselves, and hence making a mistake (e.g., falling off their bike or accidentally cutting oneself while chopping vegetables) caused them to view themselves in a particularly negative light. This would fit with previous research evidence indicating that individuals who engage in NSSI have a negative view of themselves and may interpret any type of perceived failure as further evidence to support this negative attribution of the self (Favazza, 1996; Hawton et al., 2002).

There was also a main effect for the cognition I*'m a bad person, so I have to engage in this behaviour*, whereby NSSI was more associated with thoughts about being a bad person than the accidental injury or neutral scripts. Again, previous research has indicated that a need for self-punishment and poor self-concept may contribute to individuals engaging in NSSI (Hawton et al., 2002; Laye-Gindhu et al., 2005; Skegg, 2005). However, there also was evidence to suggest that not every aspect of NSSI was viewed in a negative light. In fact, there was some indication that NSSI was viewed as a positive behaviour.

NSSI as approach behaviour

Consistent with the second hypothesis, the BPD group appeared to view NSSI as an approach behaviour to a greater extent than the NBPD group. The fact that the BPD group endorsed the view *I like to hurt myself* during the NSSI script, whereas the NBPD group did not may provide further evidence for sensation seeking motivations associated with NSSI for borderline individuals. This is consistent with

both the psychophysiological findings in Study 1, and with previous research indicating that individuals with BPD enjoy or "get a kick" out of NSSI (Kleindienst et al., 2008, p.230). This view was less pronounced in the scene and approach stages than it was for the incident and consequence stages of the NSSI script, but also was stronger for the incident stage than it was for the consequence stage. This mirrors the increase in heart rate demonstrated by the BPD group in Study 1. Again, if the BPD individuals were distressed rather than excited during the incident stage of NSSI, then it might be expected that they would not have endorsed the view 'I like to hurt myself' here. This may suggest that for individuals with BPD, NSSI represents an approach rather than an avoidance behaviour.

The finding that both groups endorsed the view *I like to hurt myself* during the NSSI script more than the neutral script is to be expected because the neutral script did not contain any experiences of injury. The fact that the view *I like to hurt myself* was not endorsed during the accidental injury script also provides further evidence that both groups responded appropriately to the experience of non-deliberate and non self-inflicted injury. This is consistent with previous research indicating that despite the fact that they engage in deliberate NSSI, these individuals will still respond in a similar manner to healthy controls when thinking about accidental injury, and are not stimulated by these types of injuries in the same way that they are specifically for NSSI (e.g., Brain, 1998; Brain et al., 1998a, 1998b, 2002; Haines, Williams, Brain & Wilson, 1995).

During the scene stage of the neutral script, endorsement of the item *I like to hurt myself* was slightly higher in comparison to the approach, incident and consequence stages. However, the effect was quite weak, and simply may have been

due to some participants taking more than a couple of minutes to re-direct their thoughts away from NSSI to the task at hand.

Interestingly, despite the fact that some individuals indicated they liked to hurt themselves, neither the BPD group nor the NBPD group endorsed the view *I see the event as positive* for NSSI. Both the scene and approach stages of the accidental injury and neutral scripts were viewed in a more positive light than NSSI, and the incident and consequence stages of the neutral script were viewed more positively than both NSSI and accidental injury. This indicated that although some individuals may enjoy the sensations of NSSI, overall they do not see this as a positive event. Previous research has indicated that despite the perceived positive aspects of NSSI (e.g., relaxation) many individuals still feel guilt and shame about their NSSI (e.g., Brown et al., 2009; Lloyd-Richardson et al., 2007).

Cognitive dissonance theory suggests that an individual may be confronted by the dilemma of knowing that a behaviour is maladaptive, but still choose to engage in the behaviour because s/he enjoys it. Common examples of behaviours in which individuals may engage despite knowing that they are damaging are smoking and drinking (Cooper, 2007). In relation to NSSI, Chapman and colleagues (2006) further speculated that the principles of cognitive dissonance may be closely linked with intropunitive motivations. For example, engaging in NSSI may serve to restore the individual's sense of control and confirm beliefs that the world is predictable. That is, the individual may feel that s/he deserves to be punished, feel anxious that s/he has not been punished, and then engage in NSSI in order to create predictability by confirming the maladaptive belief. After the belief is confirmed, then the individual's arousal decreases (Chapman et al., 2006). In this way, it may be possible that for

some individuals, the rewards that are experienced by having their predictions about themselves and the world confirmed simply over-rule the feelings of guilt and shame that are associated with knowing that NSSI is maladaptive.

Alternatively, it may be the case that NSSI is viewed as positive by individuals, but individuals simply respond in a socially appropriate way. Certainly, there has been some suggestion that individuals who engage in NSSI must view it as a positive experience to some extent, because they keep engaging in the behaviour (Walsh, 2006). This may be particularly true for those individuals who are firmly enmeshed in self-injury subculture through group participation in schools, or in Internet groups (Walsh, 2006). In the case of the current sample, it may be worth noting the possible influential factors of help-seeking and psychological assistance. For example, 46.4% of BPD individuals, and 46.4% of NBPD individuals had ever sought psychological assistance for NSSI, and 46.7% of BPD individuals and 33.3% of NBPD individuals were currently engaged in psychological treatment. These experiences of psychological intervention may have had some impact on participants' failure to see NSSI as a positive event, as one of the goals of treatment may be to find positive replacement behaviours for NSSI (Walsh, 2006). This, of course, carries with it the implication from the therapist that engaging in NSSI is not a positive, functional behaviour.

Closely related to the concept of how therapists might talk about NSSI with individuals who seek treatment is the notion of viewing NSSI as a communication tool. Specifically, there was evidence in the current study that individuals may engage in NSSI as a means of communicating distress to others.

NSSI as a means of communicating distress

The cognitive items, *I need to do something drastic, so that people will understand how I'm feeling,* and *unless I engage in this behaviour no one will know how terrible I feel* reflect a desire to influence the behaviour of others, by communicating distress. Consistent with the hypothesis that the BPD group would endorse the need to communicate distress to a greater extent than the NBPD group, the BPD group were more likely to endorse the view … *no one will know how terrible I feel* in relation to the NSSI script than the NBPD group. Previous research has indicated that individuals who engage in NSSI may believe that others will not understand the extent of their distress unless there is some physical demonstration of the distress (Walsh, 2006; Walsh & Rosen, 1988). In addition, individuals with BPD have interpersonal difficulties that are experienced more intensely than by those without the disorder (Fonagy et al., 2000).

Research has indicated that individuals with BPD struggle to communicate their feelings to others in an appropriate manner (Gunderson & Links, 2008). If an individual's coping capacity is impaired by a deficiency in the communication of distress, then the individual may feel that s/he needs to use NSSI as a communication tool. There is a wealth of research literature indicating that other individuals may see individuals with BPD as being 'manipulative' (Linehan, 1993). However, Linehan (1993) also suggested that the term 'manipulative' is inaccurate because it implies that these individuals are skilled at managing other people, which individuals with BPD are not. The view … *no one will know how terrible I feel* was rated higher for the NSSI script than the accidental injury and neutral scripts for both groups. This makes sense, given that NSSI is a behaviour which, at least to some extent, provides

a means of communicating emotional states, whereas the neutral event and accidental injury were not motivated by purposeful expression of emotion. These results were consistent with the third hypothesis. Furthermore, the scene and approach stages of the NSSI script were less strongly associated with this view than the incident stage, and scores for the incident stage were higher than scores for the consequence stage. This indicated that, at the time of cutting, individuals perhaps have increased need to bring to mind further justifications for engaging in the behaviour. Hence, for the NBPD group, the primary motivation for NSSI appears to be internal but, perhaps, at the time of cutting, secondary motivations also are brought to mind, either as a reflection of the heightened emotional state at the time, or to help justify the behaviour.

The view *I need to do something drastic, so that people will understand how I'm feeling* was more strongly associated with the NSSI script than the accidental injury or neutral scripts, at all four stages. The scene stage was associated with lower ratings of this view than the incident stage, although the approach and incident stages were rated more highly than the consequence stage. This was consistent with the hypothesis stating that endorsement of the four cognitive categories would be stronger during the approach ad incident stages of the imagery script. These results further reinforce the observation that with building anxiety, anger and tension, secondary external motivations for NSSI may become activated, although they tend to be short-lived. It may be the case that with the increased positive feelings of relaxation that are evidenced in the consequence stage (at least for NBPD individuals), participants were able to put aside angry or other negative feelings towards others and, instead, focus on the sensations of being calm. For BPD

individuals, increased feelings of excitement after engaging in NSSI also may serve to provide a distraction from previous thoughts about using NSSI to influence others.

Motivation for Self-Harm Scale

Results from the MFSH scale (Brain, 1998) provided further evidence to support the hypothesis that individuals with BPD would cite motivations relating to a need to communicate distress to a greater extent than the NBPD group. The BPD group differed from the NBPD group in that they endorsed both extrapunitive and operant motivations for engaging in NSSI to a greater extent than the NBPD group. However, the scores obtained by the BPD overall were relatively low for these items, hence, operant motivations still may only have a minor influence on NSSI.

Older research indicated that self-injury could serve as an operant behaviour (e.g., Bostock & Williams, 1974; Henderson & Lance, 1979), but none of these studies separated BPD from NBPD individuals. As widespread understanding of the motivations for NSSI have become more sophisticated, operant processes behind the behaviour have come to be viewed as having only a minor influence on NSSI (e.g., Hilt et al., 2008; Klonsky, 2007; Nock & Prinstein, 2004). Over time it has become clear that, for individuals who engage in NSSI who do not have BPD, internal motivations such as desire to reduce tension and anxiety are more likely to explain the behaviour than operant motivations. Nonetheless, it makes sense that individuals with BPD may have external as well as internal motivations for NSSI, as evidenced by their interpersonal difficulties (Paris, 1992, 2008). The response that other people have to NSSI (e.g., increased concern and support) can serve as a positive reinforcer for NSSI (Favazza, 1989; Walsh & Rosen, 1988; Walsh, 2006).

This result for the BPD group is somewhat surprising, given that these same individuals did not endorse any external motivations for their impulsive behaviours on the MIBS in Study 2, and that they were unable to identify positive emotions corresponding with their psychophysiological arousal in response to NSSI in Study 1. However, the items for operant and extrapunitive motivations on the MFSH scale do somewhat overlap with the cognitive VAS items relating to the need to communicate distress. What may be apparent from these results is that the distress experienced by individuals with BPD, perhaps, is specific to anger and a desire to upset someone else. In this way, it may be the case that individuals with BPD want to show someone else that they are distressed, but they may also want the other person to feel distressed. This could be because individuals with BPD believe that understanding from others can only be obtained if others actually share their feelings of distress. However, it could also be true that individuals with BPD believe that engaging in NSSI is an effective means of punishing or controlling other people. Both of these findings highlight the communication and interpersonal problem-solving difficulties that are experienced in this population (Levitt et al., 2004; Paris, 2008; Selby et al., 2008).

Tension Reduction was the highest rated motivation for the NBPD group and the second highest rated for the BPD group, following on from *Depression*. Again, this is interesting given that *Depression* (an internal motivation) was endorsed as a reason for engaging in impulsive behaviours in Study 2. Previously, it has been found that individuals who engage in NSSI endorsed *Tension Reduction* as the most common reason for engaging in the behaviour, followed by *Depression*, *Alienation*, *Intropunitive*, *Avoidance* and *Janus Face* (Brain, 1998). In this study, external

motivations of *Extrapunitive*, *Operant* and *Modelling* motivations also were significantly lower than internal motivations. Participants in the current study strongly endorsed internal motivations for NSSI, at least in a way that was relative to external motivation.

The influence of additional symptomatology on NSSI

Suicidology and reasons for living

Results from the RFL-48 (Linehan et al., 1983) indicated that the NBPD group endorsed *Survival and Coping Beliefs* (SCB) as a reason for not committing suicide. This indicated that the NBPD group was less likely to be suicidal, and group members were clear about the fact that they wanted to live. Studies consistently have reported that the SCB scale of the RFL-48, in particular, can be used to predict parasuicidal behaviour in a 6 month follow-up (Rietdijk, van den Bosch, Verheul, Koeter, & van den Brink, 2001). It also has been used to predict suicidal from nonsuicidal individuals in psychiatric and non-psychiatric populations (Cole, 1989; Ellis & Jones, 1996; Linehan, 1985; Rietdijk et al., 2001). One study found a difference in SCB on the RFL-48 between those individuals who were currently engaging in NSSI and those who had recovered, where those currently engaging in the behaviour had significantly lower SCB scores (Brain et al., 1998b). The BPD group in the current study did not identify any reasons for staying alive rather than committing suicide, which indicates an inability to generate coping ideas related to suicide and a low fear of suicidal acts.

It seems important at this stage to consider that: (1) these participants were able to provide an incident of NSSI to discuss for the imagery script, (2) they

verbally stated that they did not want to die during the specific incident for that script, (3) they obtained low to moderate ISS scores, (4) the BPD group and NBPD group did not differ significantly with regard to suicide attempts, hospitalisations for NSSI or overdose, or method of suicide attempt, and finally (5) the BPD group did not screen with elevated levels of depression as will be discussed later in relation to the MCMI-III results. Despite these findings, it may still be the case that, as a group, these BPD individuals may have been particularly prone to parasuicidal and suicidal behaviours and their attitude to suicide, perhaps, could be best described as ambivalent. This is consistent with both BPD pathology (APA, 2000; Linehan, 1993), and the fact that, unfortunately, 7-9% of individuals with BPD will eventually commit suicide (Perry, 1993).

In addition, one research article suggested that administering the RFL-48 in clinical practice may have limited use, and that an administration of a coping questionnaire would more adequately identify limited coping strategies as the RFL-48 is both time-consuming and a stressful experience for patients (Rietdijk et al., 2001). Knowing that individuals with BPD engage in experiential avoidance (escaping or avoiding unwanted emotions, sensations and experiences; Chapman et al., 2009; Hayes et al., 2004), it is possible that BPD participants in the current study simply avoided thinking about these experiences.

Anger

The regulation of anger is strongly related to cognitions (Roseman & Kaiser, 2001), and anger frequently has been identified as a reason for why people engage in NSSI (e.g., Bennum, 1983; Gardner & Gardner, 1975; Lloyd-Richardson et al., 2007;

Milligan & Andrews, 2005). Anger also is a core feature of BPD (APA, 2000). The results from the STAXI-II (Spielberger, 1999) indicated that the BPD group scored significantly higher than the NBPD group on all aspects of trait anger. Not only were individuals with BPD more likely to have an angry temperament, they also were more likely to externalise anger by responding to perceived criticism or unfair treatment by behaving aggressively. People who score highly on outward expression of anger are more likely to commit assaults, be verbally aggressive, or destroy objects (Spielberger, 1999). This is consistent with both DSM-IV-TR's (APA, 2000) account of Borderline pathology, and with results from the MIBS in Study 2, which demonstrated that individuals with BPD were more likely than individuals without BPD to impulsively engage in property damage.

Previous research also has indicated that externalised anger in the form of aggressive and hostile behaviour is associated with self-injury (e.g., Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969) in groups of individuals a proportion of who would be likely to meet the diagnostic criteria for BPD. Some research published in the 1990s indicated that individuals who engage in NSSI obtained higher scores on irritability, hostility and verbal or physical expressions of hostility (e.g., Darche, 1990; Haines, Williams, & Brain, 1995; Simeon et al., 1992).

In contrast, the NBPD group members were more likely to try to control their anger, so that it would not be outwardly expressed, and they were also more likely than the BPD group to use strategies (such as a deep breath) to calm themselves if they did become angry. This is consistent with a study using a sample of 240 individuals who engaged in self-injury, the results of which indicated that 80% of the sample said that they could never harm anyone else (Favazza & Conterio, 1989).

Unfortunately, a great deal of the research on anger and hostility in relation to NSSI has not differentiated between individuals with and without BPD. Hence, the presence or absence of trait anger and the role of anger control in individuals who engage in NSSI who do not have BPD remains poorly considered.

Impulsiveness, venturesomeness and empathy

Despite the fact that Study 2 provided an extensive look at impulsive behaviours in the context of BPD and NBPD groups, it was considered useful to examine trait impulsiveness, venturesomeness and empathy in the context of motivation. There were no significant group results for either venturesomeness or empathy, and mean scores were similar to those from the original sample considered by Eysenck and Eysenck (1978), and with those from two other recent studies using a BPD group which also found non-significant results (Cottraux et al., 2009; Jacob et al., 2010).

However, the BPD group were significantly more impulsive than the NBPD group which was not surprising. One previous study found a significant result for impulsiveness in BPD, with a mean of 11.4 (Jacob et al., 2010). Eysenck and Eysenck (1978) previously reported a mean score of 10 for impulsiveness in healthy controls. The role of impulsivity in BPD already has been discussed in detail in previous chapters, so will not be repeated here. What appears to have been shown here, as has been shown in previous studies (Cottraux et al., 2009; Jacob et al., 2010), is that individuals with BPD do not appear to differ from individuals without BPD in terms of venturesomeness and empathy. At least this appears to be the case for people who engage in NSSI.

Considering that the original Eysenck and Eysenck (1978) sample indicated mean scores of 10 for impulsiveness in healthy controls, it was interesting that the NBPD group obtained a lower mean score of 8.9. This, in combination with results from Study 2, may indicate that for individuals without BPD who engage in NSSI, impulsivity may not be as an important contributing factor as has been suggested by previous research (e.g., Feldman, 1988a; Mathews et al., 2003; Pao, 1969; Simpson, 1976; Zlotnick et al., 1996, 1997). Specifically, it could be the case that state impulsivity may play a role in the individual's decision to engage in NSSI, but trait impulsivity is less important. This would further emphasise the importance of addressing affect regulation skills in therapy, particularly in relation to the way in which state-dependent learning (in this case learning which occurs under conditions of high levels of distress) may contribute to maladaptive cognitions and beliefs about NSSI. However, given the wealth of research literature that has been dedicated to the understanding of NSSI as an impulsive behaviour, it would seem unusual that individuals without BPD would only demonstrate impulsivity in relation to NSSI.

Results from Study 2 indicated few differences between BPD and NBPD individuals in terms of engaging in impulsive behaviours, however there were a couple of notable differences. For example, the BPD group engaged in binge eating more frequently than the NBPD group, and they also reported a greater number of binge eating incidences. In addition, it was worthy of note that BPD individuals reported greater excitement in anticipation of risky sexual behaviour. This may suggest that the influence of positive emotions, boredom, low arousal and sensation-seeking on problematic behaviours among those with BPD. Future research may wish to examine factors such as the role of temperament, and potential subtypes of

categories of BPD in order to further understand the differences in impulsivity between BPD and NBPD groups.

As mentioned previously, research has identified that many measurements of impulsivity fail to capture the apparent impulsivity demonstrated by people who engage in NSSI. It has been suggested that the reason for this is that individuals who engage in NSSI may only demonstrate impulsivity in certain contexts, such as when they are under extreme stress, which is not apparent when participants complete standard questionnaires or laboratory tasks measuring impulsivity Glenn & Klonsky, 2010; Janis & Nock, 2009). Hence, rather than assuming that individuals who engage in NSSI are not impulsive, the research needs to consider the ways in which the relationship between stress and impulsivity may be captured in laboratory settings.

Irrational beliefs

Although the NBPD group did not differ significantly from the BPD group in their endorsement of irrational beliefs, they did obtain high scores that were at least equal to the BPD group in relation to competence, approval and a dislike of uncertainty. This is consistent with previous research indicating that individuals who engage in NSSI experience anxiety in relation to uncertainty, and that they may have strong beliefs about perfectionism and the need for approval (Slee et al., 2007; Walsh, 2006). Again, the fact that close to half of the sample had received treatment for NSSI, over 60% had received treatment for another reason (Axis I) and 30% were currently receiving psychological assistance, means that exposure to treatment may have had some impact on the absence of a significant result. It could be speculated

that through psychological treatment, some participants may have had some exposure to CBT, DBT and REBT principles about irrational beliefs and patterns of limited thinking. Research has indicated that many individuals will continue to engage in NSSI because the psychophysiological gains are so rewarding, despite the fact that they may have the cognitive skills to realise that the behaviour it maladaptive (Haines & Williams, 2003).

The BPD group endorsed a number of irrational beliefs more strongly than the NBPD group, including *the past determines current behaviours and emotions, I must be anxious if there is a risk of danger, life should be easier,* and, *it is awful to be treated unfairly.* Boelen and Baars (2007) have referred to these items using the following factor structures: Importance of past (IP), Low frustration tolerance (LFT), Demands about life (DL), and Awfulising (A). Individuals with BPD hold a range of dysfunctional or irrational beliefs that are likely to be trigged by emotional dysregulation (Gunderson, 2001). The fact that individuals with BPD placed importance on the past to a greater degree than the NBPD group mirrors research findings that have suggested these individuals tend to engage in all or nothing thinking (Alden & Osti, 1989), and to be inflexible and resistant to change (Beck et al., 1990). Linehan (1993) pointed out that individuals with BPD may be so rigid in their thinking that this limits their ability to entertain the idea that their emotions and behaviour need not always be determined by the past. She further suggested that it is common for these individuals to feel 'fundamentally flawed', in that once something is defined (e.g., "I was once bad, now I'll always be bad") it cannot ever change.

It is interesting that the items tapping anxiety about uncertainty were categorised by Boeln and Baars (2007) as low frustration tolerance, as there is a

variety of research evidence suggesting that individuals with BPD indeed do have low frustration tolerance (Gunderson & Links, 2008; Linehan, 1993). Similarly, individuals with BPD tend to have a higher tendency to experience anxiety, low tolerance for negative emotions and increased vigilance for danger or threat (Wagner & Linehan, 1999).

The demands about life (that life should be easier/better) may relate to the fact that the BPD group did not identify any reasons for living on the RFL-48. Research has indicated that individuals with BPD tend to view life as difficult due to their affect regulation difficulties (Arntz, van Genderen, & Drost, 2009). Given the additional difficulties that these individuals experience with chronic emptiness, abandonment fears, unstable relationships (APA, 2000) and other negative experiences such as anger and depression (Gunderson & Links, 2008; Linehan, 1993; Paris, 2008), it is not surprising that the BPD group wished that life was easier.

Finally, the tendency to awfulise fits with the results from the STAXI-II, which indicated that BPD individuals are particularly susceptible to reacting with anger if they feel they have been criticised or treated unfairly. Similarly, the research evidence has suggested that individuals with BPD tend to view minor inconveniences or annoyances in a catastrophic way (Linehan, 1993), meaning that there is an increased likelihood for them to feel as if they have been treated unfairly.

Perceived stress

As would be expected, the BPD group indicated a higher level of perceived stress than the NBPD group. A high degree of perceived stress is both consistent with BPD pathology, and with previous research. Individuals with BPD may be likely to

experience difficulties in interpersonal relationships and experiences such as unemployment, homelessness and legal troubles which contribute to stress (Jovev & Jackson, 2006; Skodol et al., 2002). They also are more likely to experience a greater number of negative life events, and higher rates of depressive episodes (Perry, 1988). Despite this, one study made an important observation that although individuals without BPD will be stressed about the number and severity of life events, individuals with the disorder are distressed regardless of the experience of life events (Jovev & Jackson, 2006). This may indicate that perceived stress (rather than objective examination of stressful life events) is important when considering the role of distress in BPD.

Perceived control over emotions

Again, it is not surprising that the BPD group had significantly lower levels of perceived control over their emotions than the NBPD group. This fits with results from the Belief Scale, in which both groups endorsed views such as anxiety about the unknown, and emphasis on the past as being responsible for current emotions and behaviour. Research has indicated that an individual's perceived control over the emotional consequences of events may be more important to overall adjustment than control over the situation itself (Pallant, 2000; Thompson et al., 1993, 1994).

Despite the understanding that individuals with BPD have difficulty controlling their emotions and behaviour (APA, 2000), there has been little research attention given to the role of control over internal states as part of the disorder. Hence, it will be important for future research to look beyond the measurement of daily hassles and negative life events, and look more closely at the perception of

control over one's emotions in both BPD and NBPD groups who engage in NSSI.

Additional Axis I and II disorders

The MCMI-III (Millon, 1994) was included to screen for additional comorbidity to see if there were any differences between the two groups. As a group, individuals without BPD group did not meet clinical significance levels for any additional Axis I or Axis II pathology, and all profiles were valid indicating that participants did not attempt to disguise or under-report their symptoms. However, the percentage of NBPD participants who had clinical scores for anxiety and dysthymia is of interest. Close to 35% of NBPD individuals had clinically elevated scores for anxiety, which is consistent with previous research which has indicated that anxiety is a strongly motivating factor for engaging in NSSI (Bennum, 1983; Bohus et al., 2000; Brown et al., 2002; Chapman et al., 2005; Favazza & Conterio, 1989; Kemperman et al., 1997; Walsh & Rosen, 1988). In addition, 24% of NBPD individuals obtained clinically elevated scores for dysthymia. The DSM-IV-TR (APA, 2000) stipulates that the essential feature of Dysthymic Disorder is the experience of chronically depressed mood more days than not, for at least two years. In addition, individuals experiencing dysthymia may be prone to self-criticism and distorted self-perception (APA, 2000). In this way, it may be likely that for some individuals in the NBPD group, low mood and negative cognitions could have contributed to intropunitive and affect regulation motivations associated with NSSI.

As a group, participants with BPD obtained elevated scores for anxiety and Bipolar Disorder. This was not surprising considering the rates of comorbidity reported for these disorders in the literature (e.g., Gunderson & Links, 2008; Skodol

et al., 2011a, 2011b). As previously outlined, approximately 60% of individuals with BPD will also meet the diagnostic criteria for an anxiety disorder (Zanarini et al., 2004). Hence, DSM-V will specifically incorporate anxiety into the diagnostic criteria for BPD to account for this co-occurrence (Skodol et al., 2011a, 2011b). In addition, the inflated score for BP is not surprising given the wealth of research that has been dedicated to the shared traits of impulsivity, anger and mood swings that are noted in both BP and BPD (Benazzi, 2008; Benvenuti et al., 2005; Magill, 2004; Paris, 2007, 2008; Zanarini et al., 2004). However, key researchers in the field have maintained that BPD and BP can be meaningfully differentiated by carefully considering the aetiology and precipitants of symptoms (e.g., Kriesman & Straus, 2004; Paris, 2004, 2008; Paris et al., 2007). For example, it needs to be considered that mood fluctuations in BPD are "almost always" (p. 126) related to external events and are not particularly responsive to medication, whereas in BP, mood fluctuations have a strong biological base, and individuals who behave erratically during a manic episode tend to experience grandiosity and are less likely to be responsive to other people. Furthermore, mood fluctuations in BP can be treated pharmacologically (Kreisman & Straus, 2004).

In terms of additional Axis II disorders, the BPD group had significantly higher scores than the NBPD group for Sadistic, Masochistic, and Negativistic (passive-aggressive) personality disorders. It was of note that the mean score for Masochistic personality was of clinical significance (M = 77.2) in terms of Millon's (1994) criterion. Naturally, the BPD group also obtained clinically significant scores for BPD (M = 81.7). Previous research has reported a high rate of overlap with BPD and other Cluster B disorders (e.g., Becker et al., 2000; Stuart et al., 1998), so it was

somewhat surprising that this did not occur in the current sample. The three disorders that the BPD group did obtain significant results for are not current DSM-IV-TR (APA, 2000) diagnoses, and are included in the manual as appendices for further research. They were phased out due to lack of use in clinical practice, low research volume and a high degree of overlap with other disorders (Bradley, Shedler & Westen, 2006). Nevertheless, it is possible to extrapolate some meaningful findings from these results.

Firstly, the fact that the BPD group demonstrated both Masochistic and Sadistic personality patterns makes sense given the fact that individuals with BPD often feel hurt or used by others (Gunderson & Links, 2008), and they also have issues with anger, impulsive aggression and interpersonal relationships (APA, 2000). In a study investigating the usefulness of DSM-IV appendix disorders (Bradley et al., 2006), using the Shedler-Westen Assessment Procedures (SWAP-200, Shedler & Westen, 2004) it was found that BPD was correlated with Sadistic personality disorder (.22), and was virtually indistinguishable from ASPD. Sadistic personality was characterised by items associated with sadism, psychopathy, narcissism, and hostility towards the opposite sex. Like BPD and ASPD, individuals with Sadistic personality disorder had elevated rates of alcohol and substance abuse in first-degree relatives, and a history of physical and sexual abuse. Interestingly, the authors suggested that Sadistic personality disorder may be a subtype of ASPD associated with sexual abuse. Unlike in ASPD, the sample of individuals with Sadistic personality disorder tended to have been sexually abused, and this abuse was almost always perpetrated by parents. Hence, the authors concluded that sadistic treatment in childhood is a risk for the development of sadistic behaviour in adulthood.

Although the current BPD sample did not obtain elevated scores for ASPD, it is interesting to consider the presence of sadistic personality in relation to the speculations about alexithymia and secondary psychopathy that were made about the sample in Study 1. The current sample was not asked about sexual abuse history, so without the necessary data discussion about the impact on this sample of childhood abuse in BPD is only speculative. As mentioned previously, there is a wealth of evidence to suggest that many individuals with BPD have experienced sexual abuse and that this may impact on interpersonal relationships (e.g., Fosatti et al., 1999; Kimble et al., 1997; Oddone-Paolucci et al., 2001; Zanarini, 1997). Future research may wish to look at the ways in which childhood sexual abuse, BPD, and additional sadistic personality traits influence the ways in which individuals with BPD are able to identify and communicate their emotional experiences.

Masochistic or self-defeating personality disorder is highly associated with BPD due to the shared experiences of childhood sexual and physical abuse (Bradley et al., 2006). In that study, mean age of first experience with sexual abuse (M=5.5) was significantly lower for individuals with Masochistic personality disorder than for Sadistic (M = 8.7) or BPD (M = 9.0). The duration of sexual abuse also was longer, with a mean of 8.1 years of abuse, in comparison to 4.2 and 3.5 years for Sadistic and BPD groups. Individuals with Masochistic personality disorder have a tendency to enter into multiple abusive relationships, in that they tend to choose abusive partners (e.g., Shea et al., 2000). Hence, the sample of BPD individuals in the current study may have been comprised of a majority of individuals who experienced sexual abuse, as opposed to samples of BPD individuals who have not been sexually abused. As a group individuals with BPD did not obtain elevated scores on the MCMI-III for

anxiety or PTSD, however, over half of all participants with BPD obtained elevated scores for anxiety (55% at the 75+ cut off, and 38% at the 85+ cut off), and 10% of the sample had elevated scores for PTSD. This could indicate that in future research it may be worthwhile to include a more comprehensive assessment of both past childhood abuse, and perhaps a screening tool for maladaptive relationship patterns (e.g., domestic violence and abuse).

The fact that the BPD group obtained elevated scores for Negativistic (passive-aggressive) personality disorder fits with the fact that the group could not identify any reasons for living on the RFL-48 scale, and that they endorsed beliefs such as wishing that life was easier or better, and that it is awful to be treated unfairly. People with Negativistic personalities or traits have a negative or sullen attitude towards life, are pessimistic in the ways that they experience and describe the world, and experience anger, hostility, envy and feelings of being misunderstood and mistreated (Bradley et al., 2006). They also are likely to be characterised by labile affectivity with moodiness, low frustration tolerance and explosive episodes, tending to blame their own failures on the behaviour of others. These individuals gain gratification by undermining the happiness of others, and may be petulant or demonstrate contrariness in their dealings with others (APA, 2000).

Despite low prevalence rates, one study indicated that clinicians reported Negativistic personality disorder to be one of the more common PDs they treated (Wetzler & Morey, 1999). In the study by Bradley and colleagues (2006), individuals with Negativistic personality disorder shared some similarities with BPD, but the degree of overlap was not significant.

One previous study also found elevated scores for Passive-aggressive

personality in a sample of incarcerated males who engaged in NSSI but, interestingly, did not meet the criteria for BPD or ASPD (Haines, Williams, Brain et al., 1995). This was likely due to the fact that rates of BPD in males are lower than they are for females (Haines, Williams, Brain et al., 1995). It was suggested in this study that aspects of Passive-aggressive personality, namely erratic moodiness, low frustration tolerance, explosive episodes and interpersonal difficulties, fits with descriptions of the escalating negative feelings of being unable to cope that precede NSSI. Evidence of Passive-aggressive personality in individuals who engage in NSSI also was described in one older study where the findings were used to explain the low rate of the behaviour in an ethnic subgroup (Cleghorn & Beto, 1967).

In terms of explaining this difference in additional psychopathology between the BPD group and the NBPD group, it would seem that the presence of a BPD diagnosis does, in fact, make a difference to overall psychological functioning in individuals who engage in NSSI. Certainly, the research indicates that the presence of BPD is associated with substantial co-occurring rates of psychopathology (Paris, 2008; Skodol, 2011; Trull et al., 2000). Indeed, one study reported that 90% of individuals with BPD are likely to have at least one co-occurring diagnosis (Fryer et al., 1988), which makes BPD more likely than any other diagnosis to be impacted by additional psychopathology (Zimmerman & Mattia, 1999). Separating the potential impact of co-occurring diagnoses will be important to future research in BPD, but a thorough examination of this area is beyond the scope of the current research.

Summary

Results from Study 3 indicated that although both individuals with and

without BPD endorse a range of internal motivations for engaging in NSSI, the fact that individuals with BPD have additional interpersonal difficulties means that they also are driven by a strong need to communicate their distress to others. This is likely related to both the affect regulation difficulties that these individuals experience, as well as difficulties in finding other appropriate methods of communicating their distress to others. For these individuals, NSSI may serve to alter negative emotional states, but it may also be used to influence other people. The fact that the BPD group endorsed the view that no one would understand how terrible they were feeling unless they cut themselves is evidence of this.

As expected, individuals with BPD have additional difficulties that individuals without the disorder do not have, which likely contribute to their motivations for engaging in NSSI. Consistent with BPD pathology, the BPD group were higher in trait anger, impulsiveness, anxiety and perceived stress, and more strongly endorsed a number of irrational beliefs not held by the NBPD group. They also experienced additional Axis II psychopathology, including Sadistic, Masochistic and Passive-aggressive personality patterns. In addition, the BPD group's perceived ability to control their emotions (including anger) was lower than the NBPD group, and they could not find any reasons for living.

A final important difference between the two groups was that individuals with BPD reported that they like to hurt themselves, whereas individuals without the disorder do not. This mirrors psychophysiological findings from Study 1 indicating that individuals with BPD demonstrate a de-synchronous response to NSSI as evidenced by an increase in heart rate while imagining themselves engaging in NSSI despite also subjectively reporting that NSSI triggers tension relief. This indicates

that for these individuals, NSSI can be conceptualised as an approach behaviour, in that individuals find the behaviour pleasing and exciting. What appears to have been shown in both these studies is that individuals with BPD recognise that they feel better after engaging in NSSI. However, they are unable to accurately identify what 'better' means for them. That is, they recognise a positive affective state associated with NSSI but not necessarily the specific emotions, or the corresponding increase in arousal state. However, individuals without the disorder clearly are able to identify a positive emotional state (e.g., calm or relaxed) that is consistent with a decrease in their arousal level. This suggests that a comprehensive treatment regime incorporating a broader range of affect identification and as well as regulation techniques will contribute to more effective management of NSSI in BPD.

Taking the results from all three studies into consideration, the following chapter will provide a final summary of major results, and provide suggestions for future research and treatment considerations.

CHAPTER 10

Summary and Conclusions

Summary of results, recommendations and directions for further research

Despite the fact that NSSI is known to occur in individuals with BPD as well as those without the disorder (Skegg, 2005), there have been surprisingly few research articles dedicated to investigating potential differences in these two groups. In fact, many studies reporting results for responses to NSSI do not state whether BPD was present or absent in their samples. The reason for this lack of distinction between BPD and NBPD groups appears to be based on the largely untested assumption that NSSI serves the same purpose for individuals, regardless of whether or not they meet the diagnostic criteria for BPD.

Considerable research attention has been given to the delineation of the motivational and emotional factors associated with NSSI. Although a multitude of theories to account for the behaviour have been proposed (see Suyemoto, 1998), most recognise that NSSI assists in the regulation or management of, or escape from negative emotional states (Chapman et al., 2006). Specifically, the research literature has suggested that NSSI is a maladaptive coping strategy (Haines & Williams, 2003; Kleindienst et al., 2008) that is used by the individual to assist with the regulation of the consequences of experiences such as anxiety, depression, tension, loneliness and dissociation as well as feelings of guilt and emptiness (e.g., Bohus et al., 2000; Chapman et al., 2005; Kemperman et al., 1997).

There has been consistent indication in the literature that the individual's emotional state preceding NSSI is negative and that, following NSSI, these negative emotional states end (Glenn & Klonsky, 2010; Klonsky, 2007). In this way, NSSI is a behaviour that is negatively reinforced by serving to reduce negative affect to make way for neutral or positive states (Chapman & Dixon-Gordon, 2007; Kemperman et

al., 1997).

Evidence of a tension reduction process for NSSI has been established (Brain et al., 1998a, 1998b, 2002; Haines, Williams, & Brain, 1995). Using a personalised, staged guided imagery methodology to recreate memories of experiences of self-cutting, reductions in psychophysiological arousal and negative psychological responses at the time of imaging actual self-cutting were demonstrated. This tension reduction was demonstrated with a range of populations including community based and prisoner samples.

This affect regulation function of NSSI has been assumed to be similar for those with BPD. However, when researchers have considered the function of NSSI for BPD individuals, there sometimes have been methodological problems. For example, one study, reporting to use the same personalised, staged guided imagery methodology developed by Haines, Williams, and Brain (1995) that was used in the current study, investigated evidence for escape conditioning in people with BPD who engaged in NSSI. Using results from respiratory sinus arrhythmia (RSA) and skin conductance response (SCR), evidence of a decrease in negative emotional state or tension reduction during the act of self-injury was not found (Shaw-Welch et al., 2008). However, although reporting to replicate the guided imagery methodology, there were some fundamental differences in the procedure that would make direct comparison of results between studies difficult. In addition, the question of whether NSSI in individuals with BPD serves the same function as previously identified could not be addressed because of an absence of a non-borderline comparison group.

Other researchers have noted characteristics of NSSI in BPD that do not fit with a tension reduction model of NSSI. For example, it was determined that at least

some individuals with BPD “get a kick” out of NSSI (Kleindienst et al., 2008, p. 230), suggesting an arousal increase with the act of self-injury. Although it could be argued that the behaviour is still serving an affect regulation function, such reports clearly indicate the possibility of changes other than tension reduction. Up until this point, evidence of a possible self-stimulatory function for NSSI in individuals with BPD largely has been based on anecdotal or self-report data. However, the current research contributes an important addition to the existing research literature on NSSI because it provides objective evidence of the self-stimulatory function of the behaviour in NSSI. It also contributes some additional evidence of the ways in which the combined experiences of alexithymia and interpersonal difficulties may contribute to motivation for NSSI in BPD.

With the impending release of DSM-V, future research might need to consider further classification of BPD. Recent research has been concerned with addressing the current DSM-IV-TR's (APA, 2000) failure to recognise the dimensional nature of personality disorders (Skodol, 2011; Tyrer, 2011). Beyond thinking about classifying different categories of personality disorder disturbance (e.g., four or five levels ranging from no disturbance through to severe disturbance, Crawford, Koldobsky, Mulder, & Tyrer, 2011) it may be useful to consider subtypes or clusters of BPD. For example, those who may show a more anxious or inhibited temperament versus those who are more extraverted or impulsive, who demonstrate high levels of sensation-seeking. With the future inclusion of pathological personality traits (e.g., anxiousness and disinhibition) in DSM-V, research will perhaps more easily be able to look beyond heterogeneous categories of symptoms, and consider temperamental antecedents of BPD. This would be interesting for future research to explore.

Major findings from all three studies will be summarised below, firstly in terms of the similarities and differences in BPD and NBPD groups in psychological, psychophysiological, motivational and cognitive factors associated with NSSI. Results comparing NSSI with other impulsive behaviours for the two groups will then be discussed. To reiterate demographic findings, there were no significant differences between the two groups in any of the three studies in terms of age, education, marital status or other demographic factors. Similarly, there were no group differences in terms of frequency and duration of NSSI, current suicidal intent, previous suicide attempts, hospitalisations, treatment, drug or alcohol use at the time of engaging in NSSI, or help-seeking behaviour. The majority of individuals engaged in self-cutting, and all participants were currently engaging in NSSI (i.e., they had cut in the last 12 months). Prior to investigating the groups' responses to NSSI, the only factor that distinguished the two groups was their SCID-II score. Additionally, results from the MCMI-III indicated that there were no significant group differences in Axis I psychopathology, although the BPD group did obtain significantly elevated scores for Negativistic, Sadistic and Masochistic personality disorders.

Table 35 below presents an overview of the major findings for NSSI between BPD and NBPD groups. Where possible, these factors have been split into internal (e.g., internalised experiences such as the individual's emotions) versus external factors (e.g., thoughts about the environment and/or other people, or overt expressions of emotions) to demonstrate fundamental differences in pathology between the two groups. It should be noted that Table 35 also includes significant results where there was an absence of a group difference.

Table 35

Summary of similarities and differences between BPD and NBPD groups in response to NSSI

Variable	Group diff?	*Internal factors* BPD	*Internal factors* NBPD	*External factors* BPD	*External factors* NBPD
Psychophysiological arousal	Y	Self-stimulation (heart rate increase)	Tension-reduction (heart rate decrease)		
Emotional reactions	N				
Tension		Y	Y		
Anxiety		Y	Y		
Anger		Y	Y		
Fear		Y	Y		
Unhappiness		Y	Y		
Calm		Y (immed. after)	Y (immed. after)		
Relief		Y (immed. after)	Y (immed. after)		
Excited		N	N		
Agitated		Y	Y		
Unreal		Y	Y		
Numb		Y	Y		
Risk to life		Y	Y		
In control		N	N		
Motivations	Y	ns	ns	Operant Extrapunitive	ns

Cognitions	Partial				
View event +ve		N	N		
Like hurt		Y	N		
Hate self		ns	ns		
Bad person		ns	ns		
Can't stand it		Y	Y		
Need relax		Y	Y		
Something drastic for understanding				Y (BPD>NBPD)	Y
Show how terrible feeling				Y (BPD>NBPD)	Y
Psychopathology	Y				
Irrational beliefs		(1) low frustration tolerance (2) demands about life (3) awfulising	ns	(4) importance of past on current emotions/behav	ns
Anger	Y				
Trait anger		BPD>NBPD			
Outward anger expression				BPD>NBPD	
Respond anger when Tx. unfairly				BPD>NBPD	
Attempt to ctrl anger		BPD<NBPD			
Strategies to ctrl anger		BPD<NBPD			
Perceived stress	Y	BPD>NBPD			
Perceived ctrl emotions	Y	BPD<NBPD			
Trait impulsiveness	Y	BPD>NBPD			
AXIS I		Anxiety Bipolar	ns		
AXIS II	Y	Sadistic Masochistic Passive-Aggress BPD	ns		

The most interesting result is for the differences in psychophysiological responding to NSSI imagery, because this evidence is objective and free from

potential biases associated with self-report data. Where previous research has assumed that engaging in NSSI is associated with tension reduction and a subsequent calm, positive emotional state, the current research clearly demonstrates that this is not the case for individuals with BPD. Certainly, the individual's emotional state following NSSI is still positive, but it appears to be associated with emotional arousal and excitement rather than a calm and relaxed state.

This finding of a difference in psychophysiological reactions is important, as the two groups look virtually indistinguishable in terms of their psychological reactions to NSSI. The NBPD group was able to report an emotional state that was consistent with their psychophysiological arousal at the time (i.e., increased tension and stress in the minutes leading up to NSSI, followed by feelings of relaxation and reduced stress after engaging in the behaviour). However, the BPD group was not able to accurately identify an appropriate corresponding emotional state, as evidenced by the fact that they, too, reported that they felt calm and relaxed following NSSI, despite a significant spike in their heart rate. This is consistent with previous research indicating that individuals with BPD have a fundamental incapacity to process information about their own emotions, and that they are unable to discriminate between feelings (Kroll, 1988; Levine et al., 1997; Noy, 1982), and struggle to accurately communicate emotional experiences to others (Waltz & Linehan, 2000).

In terms of motivations for NSSI, both groups endorsed internal motivations for the behaviour such as tension reduction and intropunitiveness. This indicated that affect regulation was a motivating factor for participants, regardless of BPD status. Previous research consistently has reported that NSSI is associated with a need to

detach from negative emotional experiences, and to punish oneself (Osuch et al., 1999; Rodham et al., 2004; Suyemoto, 1998). Overwhelmingly, the research literature also has indicated that the majority of people who engage in NSSI do so because they believe it will reduce tension (Brain et al., 1998a, 1998b; Favazza & Conterio, 1989; Haines, Williams, & Brain, 1995; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Lion & Conn, 1982).

As anticipated, the BPD group endorsed external motivations for engaging in NSSI to a greater extent than the NBPD group. Of interest was the finding that individuals with BPD appeared to have a strong need to communicate distress to others, and that engaging in NSSI was perceived as one way of achieving this goal. In general, external motivations for self-injury in BPD have been associated with parasuicide and operant motivations (e.g., Bostock & Williams, 1974; Henderson & Lance, 1979; O'Connor et al., 2000). There is evidence in the research literature that individuals with BPD may use NSSI to communicate their displeasure to others (Schwartz et al., 1989; Walsh & Rosen, 1988), as a means of emotional blackmail (Favazza, 1989), or retaliation (Walsh, 2006), to make others feel guilty (Favazza, 2011; Shore, 1979), and to manipulate others into complying with their wishes (Feldman, 1988a). The results from the current study also are consistent with the fact that individuals with BPD fail to accurately and appropriately communicate their feelings to others (Waltz & Linehan, 2000).

In terms of cognitions about NSI, both the BPD and NBPD groups also endorsed cognitions at the time of NSSI that were consistent with a desire to communicate distress. These cognitions were *I need to do something drastic, so that people will understand how I'm feeling*, and *unless I hurt myself, no one will know*

how terrible I feel. As expected, the BPD group endorsed both of these cognitions to a greater extent than the NBPD group, and this was significantly so for the item ...*to show how terrible I feel*. However, the overall level of endorsement for this cognition was quite low, so this needs to be taken into account when interpreting this group difference. Previous research has identified that engaging in NSSI can be perceived as an effective, albeit dangerous way of seeking social support (Hilt et al., 2008), or as a morbid form of self-help (Favazza, 2006). It has been suggested that engaging in NSSI is one way for the individual to 'dramatise' their inexpressible pain '(Selekman, 2009). In addition, Walsh (2006) suggested that one of the fundamental but dysfunctional beliefs held by those who engage in NSSI is that the behaviour also is necessary to provide some advantage or benefit.

In terms of cognitions at the time of NSSI which reflected internal motivations, the two groups again were quite similar in their responses. Both individuals with and without BPD endorsed cognitions associated with a need for tension reduction, including thoughts about increasing tension beforehand (*I can't stand this any longer*) and a need to control this tension by engaging in cutting (*I need to hurt myself in order to relax*). As outline previously, NSSI often is used as a means of controlling overwhelming or intolerable negative emotions (Darche, 1990; Chapman & Dixon-Gordon, 2007; Kemperman et al., 1997; Raine, 1982). During the first three stages of the imagery script, participants appeared to view NSSI as a positive event. This is consistent with Walsh's (2006) comments that individuals who engage in NSSI must hold the belief that the behaviour is acceptable. Only during the last stage of the imagery did participants begin to lower their level of endorsement of NSSI as a positive event. Hence, it appears that after the act of cutting, the individual

perhaps is considering the consequences of the behaviour and possible responses of others, given that NSSI generally is viewed in a negative light by other people (e.g., Favazza, 2011; Nock, 2009; Walsh, 2006). Despite the fact that individuals who engage in NSSI find the behaviour to be a useful and rewarding strategy, individuals who are at least in the *contemplative* stage of behaviour change may still acknowledge that it is neither a positive nor an adaptive behaviour (Selekman, 2009). Again, exposure to psychological treatment may have had some impact on how participants viewed their NSSI behaviour.

However, there was one major difference in the cognitions about NSSI between the two groups in that the BPD group stated that they liked to hurt themselves. This is interesting considering that these individuals were not able to accurately identify any emotions that would correspond with their increase in arousal (e.g., excitement). What this suggests is that to some extent, individuals with BPD can at least recognise that they may engage in NSSI because they like it. What it appears that they cannot do is accurately identify specific emotions that reflect an increase in arousal, so they guess. Alternatively, they perhaps are guided by others' logical suggestions that engaging in NSSI must make them feel calmer. Although the role of suggestibility in BPD has not been thoroughly researched, Paris (2002) has noted that there are groups of these individuals who may be “highly suggestible” (p. 132). Clearly, this opens up an area of research that warrants further investigation. For example, it may be beneficial to examine the responses that individuals with BPD have to NSSI with methods that require them to use free recall rather than recognition.

In terms of additional differences in psychopathology, the BPD group were

higher in trait anger, and were more likely to respond with outwards aggression and have difficulties controlling anger than the NBPD group. In contrast, the NBPD group were more likely to try and prevent their anger from being externalised, and they also were more likely to try and use strategies to calm themselves if they became angry. This is consistent with a wealth of research noting the difficulties that individuals with BPD have with anger (e.g., Gunderson & Links, 2008; Kreisman & Straus, 2004; Levine et al., 1997; Linehan, 1993; Millon, 2000; Selby et al., 2010; Sumit, 2006; Zanarini & Frankenburg, 1994). In addition, researchers have noted that the rapid and fluctuating experiences of anger in BPD are almost always a reaction to external stimuli, unlike other disorders where mood tends to be internally driven (Kriesman & Straus, 2004; Paris, 2008).

The BPD group also had higher scores for trait impulsiveness, perceived stress and irrational beliefs than the NBPD group. They also had higher scores for comorbid anxiety and Bipolar Disorder, most likely as a result of overlapping symptoms in these disorders. Research has indicated that negative life events and life problems may precipitate self-injury, particularly interpersonal problems (Haw & Hawton, 2008), and both stress and interpersonal difficulties are a fundamental aspect of BPD (Jovev & Jackson, 2006; Paris, 2008). In addition, individuals with BPD are known to experience a range of dysfunctional beliefs that are likely to be triggered by emotional dysregulation (Gunderson, 2001), which can be extremely resistant to change (Linehan, 1993).

Finally, the BPD group had significantly lower scores for perceived control over their emotions, and they could find no reasons for living (potentially indicating a higher likelihood of parasuicidal and suicidal behaviours). A perceived lack of

control over one's emotions has been shown to have a significantly negative impact on psychological adjustment, health and motivation (Gatchel, 1980; Syme, 1989; Thompson & Spacapan, 1991). Individuals with BPD are more likely to perceive external events including other people and situations as the cause for their distress (Linehan, 1993), and they have a fundamental incapacity to control and regulate their own emotions (Gunderson & Links, 2008; Paris, 2008). Although the RFL-48 may be useful for predicting parasuicidal behaviour, it possibly has limited utility in its ability to measure the presence of adequate coping strategies (Rietdijk et al, 2001). Hence, a general measure of coping may have been useful to identify potential differences in coping strategies and resources between BPD and NBPD groups.

NSSI in comparison to other impulsive behaviours

Regardless of the presence or absence of BPD, the research literature has indicated that individuals who engage in NSSI are impulsive, and are likely to behave in other impulsive behaviours such as binge eating or excessive spending (e.g., Barnes, 1985; Evans et al., 1986; Guralnik & Simeon, 2001; Hawton et al., 1999; Ojehagen et al., 1991; Reynolds & Eaton, 1986; Selekman, 2009). Indeed, some researchers (e.g., Kahan & Pattison, 1984; Pattison & Kahan, 1983; Simeon & Favazza, 2001) have suggested that NSSI perhaps is best explained as an impulse control disorder and, hence, may belong in the DSM-IV-TR (APA, 2000) with these other impulsive behaviours.

Results from Study 2 indicated that there were no major differences between the groups in terms of psychophysiological or psychological responses to or motivation for impulsive behaviours. However, it was noted that more individuals

with BPD engaged in binge-eating and property damage, which is consistent with the APA's (2000) description of impulsive behaviours in which these individuals may engage. Additionally, it was found that individuals who engaged in risky sex who were diagnosed with BPD felt excited before engaging in risk sex, whereas those who did not have BPD did not find the behaviour exciting. Previous research has indicated that engaging in risky sex may have a tension-reducing function (e.g., Coleman, 1992; Kalichman, Greenberg, & Abel, 1997; Schaffer & Zimmerman, 1990), with one study indicating that depression was a significant predictor for engaging in risky sex for young women (Paxton & Robinson, 2008). In contrast, other authors have suggested that the behaviour simply demonstrates an absence of self-control (Quadland, 1985) and, generally, is considered to be consistent with novelty seeking (Gil, 2005), meaning that it is not necessarily associated with any distress (Allen & Hollander, 2006), but rather pleasure (Teese & Bradley, 2008). Certainly, results from the current study did not appear to indicate that depression or distress was a motivating factor for risky sex in individuals with BPD. Rather, it seems to support the notion that individuals with BPD have high needs for sensation seeking. Indeed, Goodman (1993) suggested that risky sex can function both to produce gratification and as a means of escaping unpleasant emotions.

Previous research has suggested that NSSI is similar to other impulsive behaviours (e.g., Favazza & Conterio, 1989; Pattison & Kahan, 1983) and that individuals may engage in impulsive behaviours for the purposes of affect regulation (e.g., Miller, 2005; Selekman, 2009; Teese & Bradley, 2008). Indeed, it has been observed that individuals who engage in NSSI may switch back and forth from NSSI to behaviours such as binge eating, substance use and risky sex to meet different

affect regulation needs (Selekman, 2009). Taking this into consideration, it was anticipated that the responses to the impulsive behaviour may mirror individuals' responses to NSSI. That is, it was thought that for the NBPD group engaging in impulsive behaviours may mirror the arousal decrease demonstrated for NSSI, whereas the BPD group would demonstrate an increase in arousal. Despite this hypothesis, there was no evidence to suggest that engaging in impulsive behaviours is similar to engaging in NSSI in terms of either psychological or psychophysiological responses to the behaviours or motivation for the behaviours.

It was acknowledged that there possibly was too much variation in the range of impulsive behaviours examined to actually extract a meaningful result. In addition, the research may have benefited from focusing on a single impulsive behaviour, or at least a limited few to compare with NSSI. For example, previous research has indicated that binge eating is the most common impulsive behaviour that individuals who engage in NSSI will use as an alternative (Selekman, 2009). In addition, it has been suggested that the most likely affect regulatory function behind the behaviour is tension reduction (Agras & Telch, 1998; Heatherton & Baumeister, 1991; Mitchell et al., 2008; Stice & Agras, 1999; Telch & Agras, 1996).

The fact that the function of these impulsive behaviours did not share any similarities with NSSI could be seen as evidence that NSSI is a unique behaviour which, quite rightfully, does not belong in the Impulse Control Disorders section of the DSM-IV-TR (APA, 2000). Other researchers also have argued that although NSSI may be considered an impulsive behaviour, it may make more sense to conceptualise it in DSM-V as separate behavioural disorder (Shaffer & Jacobson, 2009).

Similarly, these results provide further evidence that behaviours which can be considered impulsive are incredibly varied, and may be associated with different motivations and affect regulatory functions at different times for different people. Hence, it is likely that although behaviours such as risky sex, binge eating and shoplifting share a common feature in the fact that they are impulsive, they each are unique behaviours and should be examined separately rather than making generalisations about their intent or affect regulation purpose.

Individuals with BPD are known to be higher in trait impulsivity than those without the disorder (Bornovalova et al., 2008; Chapman et al., 2010; Hochhausen et al., 2002; Kreisman & Straus, 2004; Millon, 2000), and engaging in more impulsive behaviours than other people is a defining characteristic of BPD (APA, 2000). However, the actual psychological and psychophysiological responses to impulsive behaviours and the individual's motivations for engaging in these behaviours do not appear to be moderated by the presence or absence of BPD. There was some evidence of affect regulatory motivations associated with different impulsive behaviours. For example, excessive spending, binge eating and reckless driving were associated with feelings of distress before engaging in the behaviour, and there was some indication that the intent behind engaging in the impulsive behaviour was to reduce or eliminate this distress. However, unlike engaging in NSSI which seems to carry a greater chance of actually successfully reducing this distress, other behaviours may not be as effective. For example, one researcher suggested that engaging in binge eating does not actually accomplish lasting mood change, even though people tend to believe that it does (Thayer et al., 1994).

For other behaviours such as gambling, individuals only associated this

behaviour with distress after they had engaged in the behaviour, indicating that the primary function is sensation seeking (e.g., Coventry & Constable, 1999; Schmitz, 2005). Responses to this behaviour also are likely to be influenced by the outcome of gambling (i.e., win or lose and the subsequent amount of money gained or lost), so that individuals may only feel distressed after a loss. Clearly, further research is required to clarify the affect regulatory function of different impulsive behaviours. In order to successfully treat any behaviour, it is important to understand the function of that behaviour as well as underlying mechanisms that contribute to its maintenance. Treatment for impulsive behaviours needs, firstly, to begin with a comprehensive assessment of the individual's intent behind the behaviour.

There was a significant main effect for *Depression* as a motivation for engaging in impulsive behaviours which, interestingly, was not found when considering motivations for NSSI. When group scores on the MIBS were combined, it also was apparent that *Depression* played a more important role for engaging in impulsive behaviours than *Extrapunitive*, *Operant*, *Modelling*, *Tension Reduction* and *Janus Face* motivations. When looking at the most commonly endorsed behaviours on the MIBS, 40.5% of participants completed the scale in relation to binge eating, and 35.7 chose substance use. Previous research certainly has associated depressive symptoms with binge eating (Burton et al., 2007; McElroy et al., 1995; Vollrath et al., 1992), and substance-use problems (Allen & Hollander, 2006; Burton et al., 2007; Coleman, 1992; Miller et al., 1993). Interestingly, the research evidence has indicated that an intervention targeted at depressive symptoms reduced bulimic symptoms over a six-month follow up, but did not reduce substance use. It was suggested that there is support for the affect regulation theory of bulimic

pathology, but less for substance use disorders (Burton et al., 2007). Knowing that binge eating and substance use commonly may be used as alternatives for NSSI, future research might benefit from further investigation into the affect regulatory function of these specific impulsive behaviours in comparison to NSSI.

Limitations

Firstly, it is acknowledged that data reported within the present research comes from a relatively small sample size, and that this may impact the generalisibility of the findings. In terms of potential limitations in generalisability due to geographic factors, it seems unlikely that a Tasmanian population who engage in self-injury would be unique from other populations which have been used in research from the United States, Canada or the United Kingdom. However, it is acknowledged that the results are confined to a university population. Potentially, this may have limited applicability to those BPD populations comprising of inpatients, outpatients or community samples. However, a large number of articles reporting results from individuals who engage in NSSI have used university populations (e.g., Favazza, 2006; Gratz et al., 2002; Muehlenkamp et al., 2005; Whitlock et al., 2006). One recent study also indicated that psychiatric disorders are prevalent and persistent among university students, with 60% of students meeting the diagnostic criteria for at least one psychiatric condition (Zivin et al., 2010). It is worth reiterating that those in the BPD group clearly met DSM-IV-TR (APA, 2000) criteria for the disorder and were not simply a sample of individuals with 'borderline features'. As reported in the demographic sections of the study, 37% of BPD and 21.4% of individuals without BPD had attended hospital following NSSI, with 50% of individuals with BPD, and 40% of individuals without BPD

requiring medical attention.

In addition, 40% of the BPD sample and 60% of the NBPD sample indicated that they had received both medical and psychiatric/psychological assistance in hospital as a result of NSSI. This is despite the fact that the research has indicated that most individuals who engage in NSSI will never go to hospital for treatment for their injuries, and nor will they ever come to clinical attention (Rodham & Hawton, 2009). A large-scale study of college students also found that the majority of individuals who reported engaging in NSSI had never been in therapy for any reason, and had only rarely disclosed their NSSI to anyone (Whitlock et al., 2006). However, these results certainly need to be replicated with other, non-university samples of individuals with BPD to improve the generalisability of findings.

Another important issue for psychophysiological research using individuals with BPD is that use of medication and illicit substances in this population is reportedly 80%–90% (Zanarini, Frankenburg et al., 2001) with approximately 70% of individuals reporting sustained use across many years (e.g., Zanarini et al., 2004). Certain medications such as antidepressants, anticholinergics, beta adrenergic blocking agents, benzodiazipines, opioids and neuroleptics potentially confound results from psychophysiological studies (Herpertz et al., 1999; Rosenthal et al., 2008), because they reduce sympathetic nervous system activity. Future research may need to consider how to balance the impact of medications on psychophysiological responding while still maintaining ecological validity.

In terms of other factors which may influence imagery results, it is possible that the presence of negative affect at baseline could, in turn, influence subsequent stages of the script. However, this is not something which has been explored in the

psychophysiological literature, so was not measured in the current study. It could be the case that if participants come to the laboratory in negative mood, and with high arousal that this may influence their responses to the imagery. This is something for future research to consider. However, consideration should be given to the fact that the important changes occur between scripts and across stages irrespective of a particular affective starting point. Also, it is worthy of mention that commencement of data collection occurs after a period of set up and induction to the session, during which pre-session mood is likely to be influenced. Certainly, by the commencement of data collection, participants are encouraged to be task focused.

Another factor which may have impacted the results was the fact that not all participants completed all data sets. Some of the questionnaires and VAS items were only included after initial pilot testing indicated that individuals with BPD appeared to be responding to NSSI in a positive way. Hence, there were uneven numbers of responses in some of the data sets. Additionally, some participants omitted items or entire questionnaires, which meant that there were too few cases for some of the analyses. For participants who skipped items, it is possible that the nature of their experiences influenced their non-completion of the questionnaires. For example, some items may have made participants feel uncomfortable or they were not relevant to their specific situation and these experiences. This may have important implications for the development of a comprehensive understanding of NSSI.

Despite the fact that there are now many measures of self-injury available, at the time of commencing the current research, few had been used with community populations and almost none had been applied to Australian populations. There are also challenges in using some of the available self-injury measures due to

geographical differences in terminology. For example, in Australia and the USA, the terms 'nonsuicidal self-injury' and 'deliberate self-harm' refer to self-cutting and self-burning, whereas in the UK, these terms also include self-poisoning (Claes & Vandereycken, 2007; Jacobson & Gould, 2007). The ISS (Pierce, 1977) was considered a more adequate measure due to its longstanding reliability and validity, and for its ability to assist the assessor in determining whether self-injury is likely to be suicidal, nonsuicidal or parasuicidal. Future research would certainly benefit from use of a more advanced and specific NSSI measure.

In addition, it is acknowledged that the use of unpublished tests is not ideal for research, however, there were no existing measure with which to assess participants' motivations and respones to NSSI and impulsive behaviours in particular. Future research may wish to consider validation of the MFSH scale and the MIBS and RIBS.

Another limitation exists for Study 2 in the fact that participants were given quite a range of choice as to which behaviour would be used for the impulsive script. This perhaps means that there was too much variability in responding to produce a significant result for this investigation. With greater time and a larger sample permitting, it may have been preferable to compare the psychophysiology of NSSI more specifically to the individual behaviours of binge eating and substance use, as these were the most commonly endorsed additional impulsive behaviours.

Additionally, substance use as an impulsive behaviour may need to be split into different categories according to the likely affect regulatory function. For example, it is possible that cannabis and opioids may be associated with a sense of calm and tension reduction with lower arousal whereas amphetamines and MDMA

may be associated with feelings of excitement and arousal increase. Despite the fact that the validity items “how clear was the image?”, and “how close to real life was that scene?” on the VAS were within normal limits, it is sill possible that there may be potential issues regarding the quality of participants' recall of events for scripts pertaining to substance use.

In terms of results for binge eating, it is acknowledged that imagery scripts primarily focused on the act of eating and not necessarily purging. Anecdotally, many participants who engaged in binge eating avoided discussion about purging when being interviewed for their imagery script. Whether this was due to the fact that (a) they did not engage in compensatory purging, or (b) they perhaps were reluctant to talk about this aspect of the behaviour is largely unknown as participants were not specifically assessed for the presence of an eating disorder. The MCMI-III (Millon, 1994) contains a few questions in relation to body image and practises such as self-starvation, binge eating and purging, although it does not actually provide an eating disorder subscale in the output of results. Hence, future research may wish to include a more formal measure of eating disorders to identify whether or not participants also would meet the diagnostic criteria for an eating disorder.

Research has indicated that eating disorders are extremely common in BPD (Dulit et al., 1994; Gunderson, 2001; Marino & Zanarini, 2001; Paul et al., 2002; Sansone et al., 2005; Zanarini et al., 1989, 1998) and, indeed, there may be a subtype of individuals with BPD and eating disorders (Levitt, 2005) that requires specific treatment attention. A full assessment using both SCID-I and SCID-II (First et al., 1997) would have provided much more comprehensive results, although this was beyond the scope of the current study. The MCMI-III (Millon, 1994) was used as an

efficient and cost-effective screening tool to provide some additional background information about participants' psychopathology, but it certainly could not take the place of a thorough and more formalised psychiatric assessment.

In Study 3, it was apparent that although additional psychopathology such as anxiety, mood disorder and Cluster B disorders were absent on the MCMI-III, this does not necessarily mean that they were not present. Inclusion of specific tests to assess for anxiety and depression (e.g., Depression and Anxiety Scale, DASS, Lovibond & Lovibond, 1995) may have been more useful and valid. Similarly, the elevated scores for the BPD group on both Sadistic and Masochistic personality disorders could raise questions about experiences such as childhood sexual abuse and/or current abuse in adult partnerships. Therefore, future research may wish to screen BPD samples for these experiences as the results of such research may be able to shed some further light on affect regulation and interpersonal difficulties.

Despite the fact that the MCMI-III (Millon, 1994) has reliability co-efficients that are among the highest of all psychometric personality assessments available (Beutler & Groth-Marnat, 2003), there may be a tendency for clinicians and researchers to be over-reliant on the output of results. This could contribute to misrepresentation of an individual's overall functioning, as the MCMI-III has a tendency to over-pathologise people (Schutte, 2001). The MCM-III also fails to highlight the strengths as well as the weaknesses of individuals, so it is difficult to extrapolate potential protective factors that participants may have had against mental illness, particularly in the NBPD group. It may have been useful to include a measure of coping strategies and resources used by each group in order to try and identify possible strengths and adaptive behaviours in the NBPD group.

Conclusions

What the current research has demonstrated is the importance of conducting an assessment of BPD when completing research into NSSI. Similarly, clinicians would be well advised to have patients complete an assessment of personality disorder before embarking on treatment, as individuals with BPD are likely to have different treatment needs to those without the disorder. Psychological treatments for BPD typically demonstrate only partial efficacy, and there currently are no pharmacologic treatments for BPD approved by the Food and Drug Administration. Therefore, patients often do not have access to reliable and effective treatment for their symptoms (New & Stanley, 2010).

Prior to the data reported in this thesis, the existing research had failed to thoroughly investigate the potential differences in responses to NSSI by BPD and NBPD groups. The current research has identified a number of ways in which individuals with and without BPD differ in their psychological, psychophysiological and motivations responses to NSSI. The current research also has emphasised the importance of affect regulation theory in relation to NSSI, and the need to conceptualise the behaviour in such a way that takes into account positive and negative emotions, and well as increase or decrease in affect and arousal. In treating individuals who engage in NSSI, knowing on what to focus requires a thorough understanding of the underlying processes of emotion regulation (Gratz, 2007).

For individuals without BPD, tension reduction and a desire to end negative emotional states appears to be at the core of why they choose to engage in NSSI. Encouraging skills such as distress tolerance, positive replacement skills and general

coping strategies are effective for these patients (e.g., Favazza, 2011; Selekman, 2009; Walsh, 2006). For individuals with BPD, however, treatment needs are more complex and will require therapists to think about NSSI within the broader context of BPD symptoms. Firstly, it needs to be acknowledged that relying on self-report information only is likely to provide limited and even inaccurate information about the emotional experiences of BPD individuals. These patients can distinguish between the dichotomous experiences of positive and negative affect, however, they struggle to identify specific emotions that correspond with their internal arousal states. Therefore, they may identify that engaging in NSSI makes them feel 'better', but they may be unable to differentiate between better and calmer, or better and excited. Therapists need to be careful about not making well-intentioned and logical, but perhaps unfounded suggestions about what their patients are feeling. It is possible that individuals with BPD will go along with suggestions that engaging in NSSI makes them feel calmer, because they do not have the capacity to adequately identify or describe emotional states. The role of alexithymia in BPD has been well-documented, and results of the current study provide further indication that this needs to be considered more closely. Specifically, teaching patients to identify all components of an emotional response (psychological, psychophysiological, behavioural), as well as their interpretations of events that prompt the response may promote more effective emotion regulation skills in individuals who engage in NSSI (Gratz, 2007).

Future research may wish to further assess the role of de-synchronous responses in BPD by using other methodologies that results in the collection of more objective data. Micro-expression detection would be one possible method of

examining the nonverbal behaviours of BPD individuals. Research evidence has suggested that facial expressions are an important component in the detection of suppressed affective reactions (e.g., Warren, Schertler, & Bull, 2008). Results from such an examination with BPD individuals may further demonstrate a de-synchronous pattern of responding with regard to *process* versus *content* in Borderline pathology, specifically with regard to communication. That is, it may be possible to detect the presence of inconsistency between what the individual with BPD says s/he feels in response to his/her behaviour (e.g., 'I feel calm when I cut myself') and his/her nonverbal behaviours such as facial expressions.

Research is now beginning to demonstrate evidence that most individuals with BPD are potentially 'hard-wired' with a strong, biologically-based need to engage in NSSI. For example, recent research has identified that individuals with BPD have an opioid deficiency, especially in beta-endorphins and met-enkephalins (New & Stanley, 2010; Prossin et al., 2010; Stanley & Siever, 2010; Stanley et al., 2010) and self-cutting is used as a method of endogenous opioid generation (New & Stanley, 2010). In fact, this observation has led to efforts to treat BPD with opiate antagonists by eliminating the positive feedback from cutting (New & Stanley, 2010).

However, it has been found that opiate antagonists only slightly decrease NSSI, and they do not improve the intrapsychic distress that has been reported to lead to NSSI (Schmahl et al., 2010). This lack of diminished distress also is consistent with the model of opioid deficiency, and means that pharmacological treatment for BPD should be targeting the μ-opioid receptor (New & Stanley, 2010). What this means for psychological treatment is that therapists will need to consider

not only tension reduction properties of NSSI (and potentially other impulsive behaviours), but how BPD individuals' needs for sensation seeking combined with their low tolerance for boredom might be addressed with more adaptive behaviours. In addition, the fact that individuals with BPD endorse external motivations for NSSI further highlights the severe interpersonal and communication difficulties that these individuals experience. Hence, treatment also needs to continue to focus on teaching individuals appropriate assertiveness and problem-solving skills.

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APPENDICES

APPENDIX A

Information and Consent forms for Study 1, Study 2 & Study 3

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Psychological, psychophysiological and motivational factors associated with nonsuicidal self-injury

The above project is being conducted by Mrs Erin Bowe, Dr Janet Haines and Professor Douglas Paton of the School of Psychology at the University of Tasmania. The purpose of this study is to examine different psychological, psychophysiological and motivational factors associated with nonsuicidal self-injury. The study is also interested in comparing individuals' responses to nonsuicidal self-injury and other impulsive behaviours in order to determine if individuals engage in these behaviours for similar reasons. The results of this project may contribute to a greater understanding of the different reasons behind why individuals engage in self-injury, thereby improving the types of treatments available. This project is being undertaken as part of a PhD (Clinical) degree.

If you agree to participate, you will be interviewed about the following: a specific event in which you engaged in nonsuicidal self-injury; an event of your choosing that involved an accidental injury; an event of your choosing that involved an example of impulsive behaviour (such as binge eating, over-spending or other behaviours) and an emotionally neutral event (such as making a cup of coffee) that will be used for comparison purposes. The information from the interview will then be used to devise imagery scripts that will be used to guide you through the memory of events. An imagery script is a structured, written account of the story provided by you during the interview.

You will be asked to attend the laboratory at the University of Tasmania and have electrodes and measurement instruments applied to your torso and fingertips so that measures of heart rate and respiration can be taken. The application of these electrodes is very safe and not intrusive and you will not be required to remove any clothing. The administration of these electrodes and measurement instruments do not cause discomfort although it should be noted that there is a very small risk of skin rash. Please let us know if you have any allergies.

These measurements will be taken while you are guided through imagery of an episode of self-injury, an accidental injury, an emotionally neutral event of your choosing, and an impulsive behaviour. You will be asked to rate your psychological response to the content of the imagery scripts as well as the accuracy of their content, and how easy it was for you to visualise the details. In addition, you will be interviewed about your reactions to the events. You will also be asked to complete a range of questionnaires and rating scales that are designed to elicit information about the following: your reasons for engaging in self-injury and other impulsive behaviours, psychological symptoms such as stress and anxiety, and what type of personality you have. The questionnaires will be used for comparison purposes; to gain further insight into the ways that individuals who engage in non-suicidal self-injury may be similar or dissimilar from one another. For example, different psychological states or personality variables may influence the reasons that individuals engage in nonsuicidal self-injury, and the behaviour may be influenced by different levels of impulsiveness. The questionnaires generally take most people 45 minutes to 1 hour to complete and you will be able to take the questionnaires away with you and complete at a suitable time. The interview will take approximately 1-1.5 hours of your time and the laboratory session will take approximately 1 hour. In total, the research takes approximately 3-3.5 hours to complete.

We wish to emphasise that the information you share with us will be treated in a confidential

manner. Code numbers are used to protect individuals' identity, so you will not be able to be identified in any research output, and all information that you provide will remain anonymous. All written information and computer data files will be stored with a code rather than your name. The data will be secured in a locked cabinet. Furthermore, the data collected from this study will be kept in the School of Psychology for at least 5 years and will be destroyed by shredding paper documents and erasing any other files.

Participation in this study is completely voluntary. If you agree to participate in the study but then change your mind and wish to withdraw, you may do so at any time without prejudice. You may also choose to withdraw any data that you have provided. If you are receiving counselling, psychological or psychiatric support for self-injury or other reasons, you may wish to discuss participation in this project with your counsellor or psychologist/psychiatrist prior to commencement.

Some people may find that talking about their stressful experiences is difficult and causes anxiety. If this is the case for you, we recommend that you do not participate in this project because we are asking for people to discuss the nature of their reactions to their experiences. In addition, if you agree to participate but then find it causes you undue anxiety to talk about these issues, please let us know. We will assist you with your anxiety and provide you with the opportunity to withdraw from the study. We do not wish for participation in the project to be distressing for you.

First year Psychology students who agree to participate in this study will receive course credit for their time. If you wish to discuss the project before, during or after participation, please contact Mrs Erin Bowe at edeveney@utas.edu.au; or Dr Janet Haines on (03) 6226 7124 or at J.Haines@utas.edu.au.

This project has been approved by the Human Research Ethics Committee (Tasmania). If you have any concerns or complaints regarding the ethical nature of the project, you may contact the Acting Executive Officer of the Human Research Ethics Committee. The contact details are as follows: Marilyn Pugsley, Acting Executive Officer of the Network, (03) 6226 7479 or at marilyn.pugsley@utas.edu.au.

Should you wish to discuss your experiences with self-harm with someone unaffiliated with the project, we would suggest that students contact Student Counselling (telephone: 6226 2805), the University Psychology Clinic (telephone: 6226 2805), or your general practitioner. The services provided by Student Counselling are free for students. The services provided by the University Psychology Clinic are free for everyone, regardless of whether you are a student or not (telephone: 6226 2805). Alternatively, participants who are not students can also consult their General Practitioner. If you require immediate assistance, please let us know as we would be happy to provide support.

We would be happy to discuss your individual results with you. Overall results will be available in hard copy or electronic form on the School of Psychology website at the completion of the project if you are interested (www.scieng.utas.edu.au/psychol/). If you decide to withdraw form the project, we would welcome the opportunity to discuss with you any concerns you have about the project and your participation in it.

Please keep this information sheet and, if necessary, refer to the information it contains. In addition, if you agree to participate, you will be asked to sign a statement of informed consent. A copy of this statement will be provided to you.

Thank you.
Erin Bowe.

STATEMENT OF INFORMED CONSENT

I have read and understood the 'Information Sheet' for this study. The nature and possible effects of the study have been explained to me.

I understand that the study involves:

6. Discussing an incident of nonsuicidal self-injury that I have experienced;
7. Discussing an accidental injury of my choosing (which did not involve nonsuicidal self-injury);
8. Discussing an emotionally neutral event of my choosing;
9. Discussing an example of an impulsive behaviour which I have engaged in
10. Attending a recording session and having electrodes and measurement instruments fitted so that recordings of my heart rate and respiration can be taken while I am being asked to image aspects of the events;
11. Rating my psychological responses to these events;
12. Completing questionnaires about the nature of my psychological response to the events, my personality, my psychological status, my reasons for self-injury and how impulsive I am.
13. The duration of the interview and the laboratory session is 1-1.5 hours each.
14. Questionnaires take 45minutes to 1 hour to complete.

I understand that the data collected from this study will be kept in the School of Psychology for at least 5 years and will be destroyed by shredding paper documents.

I understand that all research data will be treated as confidential in that no person other than the researchers will be able to identify me when results are stored or presented and that my name will not be attached to the data that are collected. Any questions that I have asked have been answered to my satisfaction. I agree to participate in this study and understand that I may withdraw at any time without prejudice, and that I may also choose to withdraw any data that I have provided. I agree that research data gathered for the study may be published. I am aware that I will not be able to be identified in the published material.

Name of participant: ……...

Signature of participant: …….. Date: ……...

I have explained this project and the implications for participation in it to this volunteer and I believe that the consent is informed and that s/he understands the implications of participation.

Name of Investigator: Erin Bowe

Signature of investigator: …….. Date: ……...

APPENDIX B

Unpublished scales used in Study 1

Demographic Information

Please indicate your gender? **M / F**

Please indicate your age (in years)? _____

Marital status:
- ☐ Single
- ☐ Married/ de Facto
- ☐ Separated/Divorced
- ☐ Widow/er

Education: Level Completed

- ☐ Primary
- ☐ Secondary
- ☐ Year 12
- ☐ TAFE
- ☐ University

History and current patterns

Have you engaged in any self-injury in the last year? **Y / N**

When was the last time you injured yourself?

- ☐ In the last month
- ☐ In the last 6 months
- ☐ In the last year
- ☐ More than 1 year ago

On average, how often would you engage in self-injury?

- ☐ Daily
- ☐ Weekly
- ☐ Fortnightly
- ☐ Monthly
- ☐ Yearly

Overall, approximately how many times have you engaged in self-injury?

- ☐ Less than 5
- ☐ More than 5 but less than 50
- ☐ 100 times or less
- ☐ 500+

If you know more specifically how many times, then please indicate
……..

How long (i.e., how many months or years) have you been engaging in self-injury?

……

Have you ever sought psychological assistance (e.g., counseling or therapy) for self-injury? **Y / N**

If YES, then how long had you been engaging in self-injury before you sought help?

……

Have you ever sought psychological assistance for any reason (not necessarily self-injury)? **Y / N**

If known, what was the diagnosis associated with this treatment? (e.g., anxiety, depression)

……

Have you ever been hospitalised because of self-injury? **Y / N**

If YES, what type of assistance did you receive during your time in hospital?

□ Medical assistance for the injury (e.g., stitches, bandages, antiseptic etc. for the wounds)
□ Psychological/psychiatric care or support

Have you ever attempted to commit suicide?

□ No
□ Yes, and it involved self-cutting, burning etc.
□ Yes, and I used a different method (e.g. overdose- please describe)

……

Have you recently experienced any thoughts about suicide? **Y / N**

Have you previously experienced thoughts about suicide? **Y / N**

In general, when you engage in deliberate self-injury, do you drink alcohol or take drugs around that time?

□ Rarely or never
□ Sometimes
□ Almost always

Self-injurious behaviours checklist

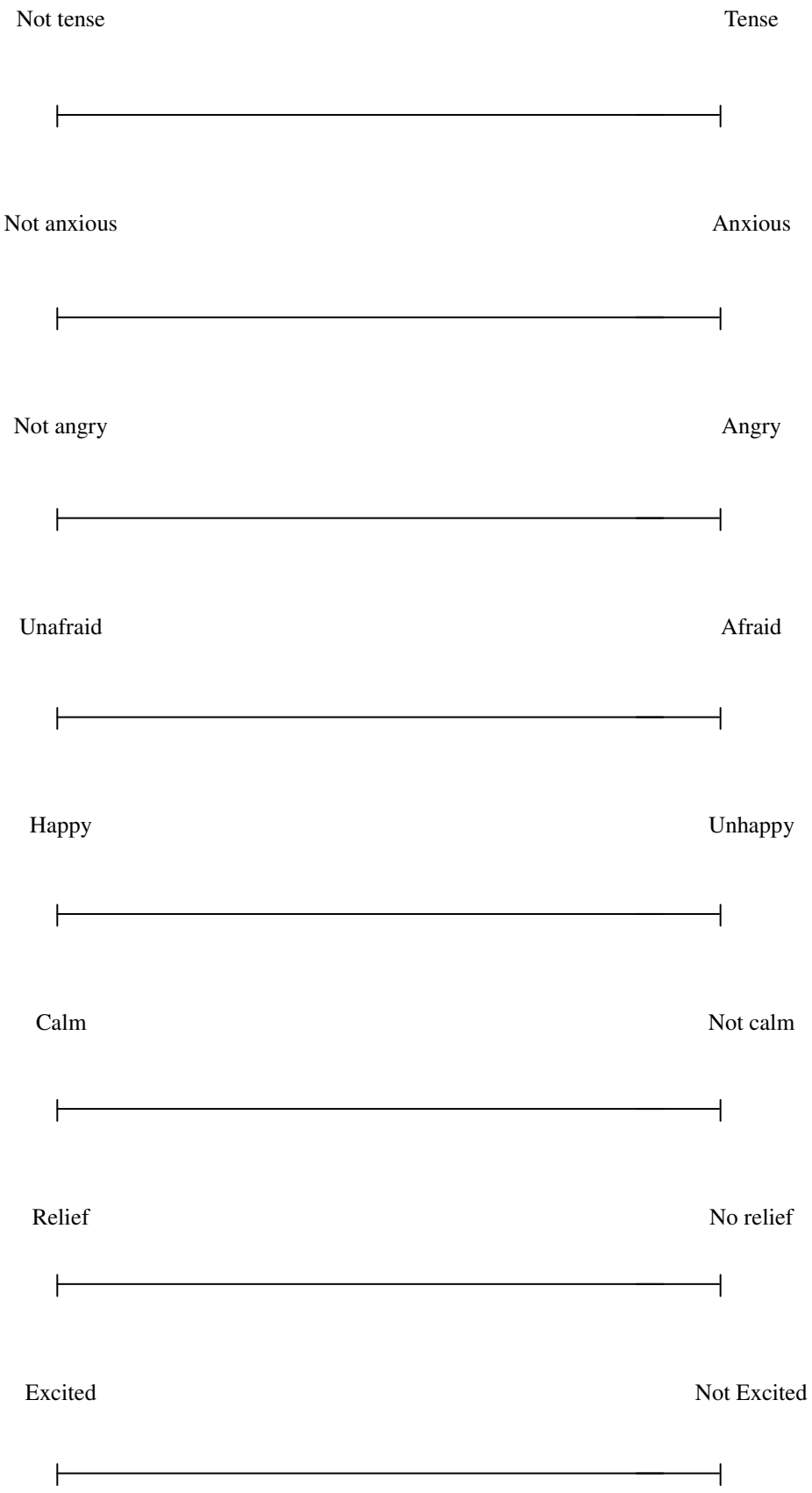
When answering, it may be useful to consider whether or not you intended to deliberately hurt yourself when engaging in these behaviours.

Behaviour	**Frequency- e.g., hourly, daily, no. times per week/month/year…**	**Instruments used**	**Body parts injured**
Skin-cutting			
Self-biting			
Skin scratching/ abrasion/tearing/ Grazing			
Inserting objects under skin			
Skin-burning			
Self-skin piercing or puncturing (for non-cosmetic/cultural purposes)			
Swallowing solid objects			
Self-hitting			
Head/body/arm etc. banging			
Hitting or kicking objects (e.g., punching walls)			
Wound scraping/picking/interfering with healing etc.			
Bone-breaking			
Hair pulling (including eyelashes & eyebrows) that is not for grooming purposes			
Others- please elaborate:			

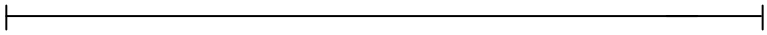
APPENDIX C

Visual Analogue Scales used in Study 1 and Study 2

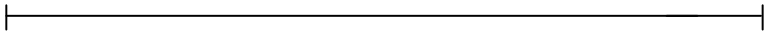
VAS items for Study 1 and Study 2



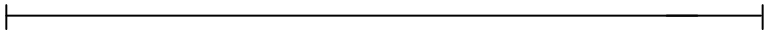
Not agitated Agitated



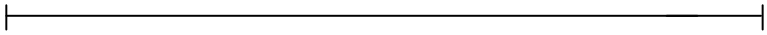
Real Unreal



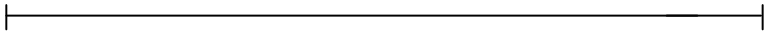
Not numb Numb



No risk to life Risk to life



In control Not in control

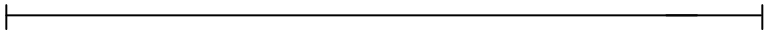


How clear was the image of yourself in that scene?

Unclear Clear

How close to real life was that scene?

Not close Close



APPENDIX D

Descriptive statistics for Study 1

Psychophysiological data (heart rate)

Table 36

Means and standard deviations for heart rate (beats per minute) for each stage of each script for the BPD and NBPD groups

Script	*Scene*		*Approach*		*Incident*		*Consequence*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
NSSI								
BPD	76.7	11.6	77.3	12.0	80.0	12.4	76.7	10.5
NBPD	80.9	12.2	81.4	11.3	78.8	11.4	78.2	11.3
Accidental injury								
BPD	75.6	12.0	74.6	13.6	76.6	12.7	75.3	13.0
NBPD	78.9	11.7	79.5	12.3	79.8	10.8	79.7	12.4
Neutral								
BPD	74.3	12.0	72.7	11.9	73.7	11.9	73.6	11.9
NBPD	78.1	11.5	78.5	11.5	78.4	12.4	78.2	11.0

Psychological data (responses to imagery on VAS)

Script x Stage x Group Means and Standard Deviations

Table 37

Mean scores and standard deviations for the VAS measures for each stage of each script for BPD and NBPD participants

VAS Item	*Scene*		*Approach*		*Incident*		*Consequence*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Tense								
NSSI								
BPD	73.2	29.2	78.0	25.7	71.7	62.1	39.2	37.2
NBPD	63.8	36.1	67.3	33.7	30.1	32.9	35.6	31.0
Accidental injury								
BPD	23.4	29.3	30.5	36.3	55.1	69.9	49.0	62.8
NBPD	22.3	24.6	30.5	31.5	35.8	30.8	33.5	32.0
Neutral								
BPD	12.1	7.3	8.9	7.2	6.9	11.4.	9.7	16.9
NBPD	18.1	9.9	13.0	10.5	7.1	10.7	11.0	19.8
Anxious								
NSSI								
BPD	71.0	30.5	78.2	25.7	75.4	27.7	36.9	33.3
NBPD	64.4	33.8	68.9	34.3	57.7	34.6	39.5	33.3
Accidental injury								
BPD	25.6	28.8	28.4	30.0	51.9	37.8	52.6	33.7
NBPD	23.3	27.0	36.1	31.8	64.3	34.0	63.8	31.4
Neutral								
BPD	14.6	19.9	10.7	15.0	6.6	10.1	6.4	8.4
NBPD	7.1	9.4	8.0	11.6	5.8	8.6	11.1	19.8
Anger								
NSSI								
BPD	71.9	34.5	69.7	34.4	62.5	38.1	40.3	35.0
NBPD	63.1	33.4	65.2	35.8	54.7	38.0	41.8	36.0

Accidental injury								
BPD	14.4	25.8	18.0	24.3	41.0	38.4	35.3	38.8
NBPD	18.7	25.8	21.1	27.1	42.2	36.9	43.0	36.1
Neutral								
BPD	6.4	11.1	3.7	5.5	3.7	6.5	3.9	5.2
NBPD	5.3	7.3	6.2	9.2	5.0	8.0	8.3	18.0
Fear								
NSSI								
BPD	50.2	39.8	52.1	38.3	57.7	34.2	43.3	38.9
NBPD	51.9	35.0	50.4	38.7	39.9	35.6	39.9	37.8
Accidental injury								
BPD	13.0	21.2	22.4	28.6	43.0	39.4	33.3	35.2
NBPD	17.1	24.2	29.3	34.6	50.2	37.4	53.1	36.0
Neutral								
BPD	3.7	4.0	2.3	4.2	5.4	6.1	15.6	8.2
NBPD	6,1	9.0	3.3	3.3	6.3	2.7	3.5	18.6
Unhappy								
NSSI								
BPD	78.5	28.7	79.6	28.8	74.5	33.8	59.2	35.9
NBPD	79.1	21.1	74.6	34.2	64.1	32.2	56.9	32.1
Accidental injury								
BPD	25.8	29.2	32.2	33.2	60.4	31.1	49.8	34.4
NBPD	31.7	25.0	33.3	26.8	71.4	27.4	70.1	29.0
Neutral								
BPD	21.2	17.5	17.9	17.3	16.6	19.8	20.0	20.7
NBPD	19.8	17.4	21.6	22.8	17.7	14.2	17.7	19.9
Calm								
NSSI								
BPD (n = 16)	20.9	26.8	24.5	23.3	32.7	28.6	58.7	35.7
NBPD (n = 19)	27.9	32.2	21.5	27.9	40.8	31.2	63.9	33.5
Accidental injury								
BPD	62.8	34.5	59.1	26.5	34.4	34.4	51.0	34.0
NBPD	65.9	28.4	67.9	24.2	36.6	30.9	38.3	31.9
Neutral								
BPD	84.9	12.1	86.5	15.2	81.8	17.6	89.4	11.4
NBPD	88.5	14.9	88.4	13.3	88.2	14.9	87.9	14.8

Relief								
NSSI	13.3	25.2	13.1	17.3	43.7	30.1	69.9	36.4
BPD	21.4	23.1	20.3	23.2	48.3	29.3	63.6	36.3
NBPD								
Accidental injury								
BPD	42.3	29.0	41.7	30.3	23.9	30.1	48.0	37.0
NBPD	59.9	31.8	52.0	29.7	31.0	29.0	31.1	30.8
Neutral								
BPD	52.1	26.8	53.1	26.7	51.5	30.9	69.6	33.5
NBPD	70.1	31.0	72.0	30.8	37.2	30.9	70.3	38.8
Excitement								
NSSI								
BPD	13.2	25.2	28.6	33.7	32.9	36.3	21.2	29.6
NBPD	28.4	29.0	26.8	28.8	29.0	31.9	21.3	18.4
Accidental injury								
BPD	54.1	35.6	49.5	36.2	27.1	31.5	28.8	33.9
NBPD	48.6	33.4	48.3	31.7	29.6	30.2	28.4	28.9
Neutral								
BPD	30.8	23.0	37.1	24.9	30.7	29.3	47.2	29.8
NBPD	32.3	33.7	38.1	36.3	32.7	33.4	32.1	32.6
Agitation								
NSSI								
BPD	69.6	35.6	68.6	34.9	51.7	38.2	34.3	33.6
NBPD	66.2	29.1	64.8	34.8	53.2	36.7	35.9	35.3
Accidental injury								
BPD	26.5	31.1	23.7	23.6	67.1	33.6	54.0	39.7
NBPD	26.2	31.0	29.5	29.8	58.6	29.9	50.5	32.4
Neutral								
BPD	6.9	7.4	6.2	8.0	7.1	10.3	2.9	2.7
NBPD	5.7	7.0	7.9	12.6	5.5	8.0	6.6	9.6
Unreality								
NSSI								
BPD	40.8	34.1	48.4	37.8	57.2	34.6	48.5	37.1
NBPD	33.9	33.8	41.2	34.4	49.1	35.9	44.7	35.9
Accidental injury								
BPD	7.6	9.2	10.9	19.4	27.4	34.2	20.3	30.0
NBPD	15.9	21.2	16.3	22.6	29.5	30.4	22.5	29.3

Neutral								
BPD	5.3	5.8	6.1	10.6	17,1	13.4	3.4	4.6
NBPD	10.7	17.8	14.8	24.4	11.4	19.4	9.6	16.5
Numb								
NSSI								
BPD	46.4	37.0	52.3	37.7	61.6	35.9	55.1	38.5
NBPD	35.7	35.7	40.1	36.9	56.2	34.9	56.5	33.7
Accidental injury								
BPD	10.7	21.0	16.2	27.1	27.7	33.9	27.2	34.4
NBPD	18.9	25.8	19.4	27.8	27.8	29.8	30.0	30.9
Neutral								
BPD	9.0	17.1	6.7	14.2	6.8	16.0	4.1	5.8
NBPD	12.3	19.1	11.4	19.4	12.9	21.7	10.6	17.9
Risk to life								
NSSI								
BPD	25.7	28.5	28.1	29.7	40.2	38.5	22.3	31.0
NBPD	21.2	26.4	23.1	29.1	32.2	32.1	21.4	30.0
Accidental injury								
BPD	5.2	9.5	12.2	23.4	26.3	36.2	19.3	31.1
NBPD	11.7	22.4	12.6	22.3	24.9	32.2	23.1	30.0
Neutral								
BPD	2.9	3.6	2.2	3.1	2.0	3.3	5.5	17.8
NBPD	6.7	16.9	5.0	7.1	4.2	5.8	3.6	4.8
Control								
NSSI								
BPD	36.9	32.4	50.9	38.0	49.1	34.9	54.9	36.2
NBPD	45.6	32.8	47.3	38.6	51.6	38.4	52.4	38.5
Accidental injury								
BPD	78.7	33.1	72.0	34.4	51.4	35.8	59.3	39.3
NBPD	73.4	35.6	69.7	31.0	42.1	34.1	42.1	34.8
Neutral								
BPD	86.1	27.7	85.2	86.1	25.4	81.5	29.7	78.0
NBPD	85.7	25.1	27.6	88.6	20.8	86.1	26.6	33.2
Clear								
NSSI								
BPD	84.3	18.7	88.8	15.2	87.0	24.0	88.1	19.9
NBPD	86.8	15.9	88.3	11.9	88.4	16.8	84.9	18.4

Accidental injury								
BPD	88.3	13.0	88.4	14.9	85.9	22.2	91.3	15.2
NBPD	86.6	14.0	84.7	17.9	83.7	22.9	84.4	18.7
Neutral								
BPD	89.1	14.1	87.8	15.8	89.0	14.4	89.3	15.8
NBPD	92.0	9.1	91.4	9.8	90.5	10.1	90.0	10.7
Close								
NSSI								
BPD	84.5	17.2	87.7	16.4	90.3	12.1	87.6	16.9
NBPD	84.3	16.7	84.7	18.2	88.4	20.1	85.0	20.2
Accidental injury								
BPD	90.4	12.4	91.2	10.8	90.0	15.5	91.7	9.7
NBPD	84.9	16.3	85.5	16.5	86.2	20.4	84.7	19.5
Neutral								
BPD	89.3	14.2	90.1	13.1	91.7	11.6	91.0	11.2
NBPD	91.9	10.6	92.0	10.5	92.0	8.0	91.2	9.9

Descriptive Statistics for Script x Stage

Table 38

Means and standard deviations for VAS items comparing script by stage

VAS Item	*Scene*		*Approach*		*Incident*		*Consequence*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Tense								
NSSI	68.5	32.9	72.6	30.2	66.9	31.6	38.2	33.1
Accidental injury	22.9	26.8	33.4	30.9	62.5	33.9	55.9	33.2
Neutral	9.7	14.7	8.0	11.7	7.0	11.0	10.3	18.2
Anxious								
NSSI	67.7	32.1	73.6	30.4	66.6	32.3	38.2	33.0
Accidental injury	24.4	27.7	32.2	30.9	58.1	36.2	58.2	32.8
Neutral	10.8	15.9	9.3	13.4	6.2	9.3	8.7	15.3
Anger								
NSSI	67.5	33.9	67.4	34.9	58.6	37.9	41.0	35.2
Accidental injury	16.6	25.6	19.5	25.6	41.6	37.4	39.1	37.4
Neutral	5.8	9.3	4.9	7.6	4.4	7.2	6.1	13.3
Fear								
NSSI	51.0	37.1	51.2	38.1	43.8	34.8	41.6	38.1
Accidental injury	15.0	21.7	25.8	31.7	46.6	38.3	43.2	36.7
Neutral	4.9	7.0	3.3	4.5	4.7	11.9	5.4	13.5
Unhappy								
NSSI	78.8	25.0	77.1	29.9	69.3	33.1	58.0	33.8
Accidental injury	28.7	27.1	32.8	30.0	65.9	29.6	59.9	33.1
Neutral	20.5	17.3	19.7	20.2	18.2	18.8	17.4	18.9
Calm								
NSSI	24.7	29.6	22.8	25.5	37.1	29.9	61.5	34.1
Accidental injury	64.5	30,9	63.9	25.3	35.6	32.1	44.1	33.1
Neutral	86.9	13.6	87.5	14.0	85.3	16.3	88.6	13.2
Relief								
NSSI	17.7	24.1	17.0	20.7	46.2	29.3	66.5	36.0
Accidental injury	51.9	31.4	47.3	30.0	27.0	29.3	38.8	34.3
Neutral	61.9	30.1	63.4	30.1	63.3	32.3	70.0	31.6

Excitement								
NSSI	21.5	28.0	27.7	30.6	30.8	33.6	21.2	23.8
Accidental injury	51.1	31.0	48.9	33.3	28.5	30.3	28.6	30.8
Neutral	31.6	28.9	37.6	31.2	31.8	31.2	39.0	31.8
Agitation								
NSSI	67.7	31.8	66.5	34.3	52.5	37.9	35.2	34.0
Accidental injury	26.3	30.6	26.9	28.6	62.5	31.4	52.1	35.5
Neutral	6.2	7.1	7.1	10.6	6.3	9.0	4.9	7.5
Unreality								
NSSI	37.3	33.8	44.8	36.0	53.1	33.2	46.6	36.2
Accidental injury	11.7	16.7	13.6	21.1	28.4	32.1	21.4	29.4
Neutral	7.9	13.4	10.4	19.2	9.3	16.7	6.5	12.4
Numb								
NSSI	14.1	36.4	46.2	37.5	58.9	35.2	55.8	35.9
Accidental injury	18.8	23.7	17.0	27.3	27.7	31.6	28.6	32.5
Neutral	10.7	18.0	9.0	17.0	9.8	19.1	7.3	13.6
Risk to life								
NSSI	23.4	27.3	25.6	29.2	36.2	35.4	21.9	30.2
Accidental injury	8.5	17.3	12.4	22.6	25.6	34.0	20.7	30.4
Neutral	4.8	12.2	3.6	5.6	3.1	4.8	4.5	13.0
Control								
NSSI	41.3	32.6	49.1	38.0	50.3	36.4	53.6	37.1
Accidental injury	76.0	34.2	70.9	32.5	46.7	34.9	50.7	37.8
Neutral	85.0	26.2	85.7	26.3	85.1	25.7	82.4	30.1

APPENDIX E

Unpublished scales used in Study 2

Brief DSM-IV Impulsive Behaviours Checklist (to facilitate imagery script)

Have you ever engaged in any of the following behaviours?

☐Gambling

☐Excessive spending/shopping?

☐Binge eating (may also include purging)

☐Risky sexual activities (e.g., unsafe sex, 'one night stands', or 'promiscuous sex')

☐Substance use

☐Reckless driving

☐Stealing/shoplifting

☐Impulsive damage to property? (e.g., setting fires, damaging or destroying your own or someone else's things)

Impulsive Behaviours Checklist

Below is a list of behaviours which may be considered impulsive in nature due to the fact that they involve some amount of risk to oneself and/or other people. Please indicate if you have ever engaged in any of the following behaviours, and complete any additional questions on those listed behaviours that you have engaged in.

Behaviour	Have you ever engaged in this behaviour?	Have you engaged in this behaviour in the last year?	How often would you generally engage in this behaviour (or used to, if no longer)?	Approximately, how many times total have you engaged in this behaviour?	How long have you been engaging in this behaviour (if you have stopped, how long before you stopped)?	Have you ever sought psychological/medical assistance for this behaviour?
Substance use	Y/N	Y/N	Daily Weekly Fortnightly Monthly Every few months Yearly or less	Less than 5 More than 5 but less than 100 More than 100 More than 500	Less than 6 months More than 6 months More than 5 years	Y/N
Reckless driving	Y/N	Y/N	Daily Weekly Fortnightly Monthly Every few months Yearly or less	Less than 5 More than 5 but less than 100 More than 100 More than 500	Less than 6 months More than 6 months More than 5 years	Y/N
Stealing/ shoplifting	Y/N	Y/N	Daily Weekly Fortnightly Monthly Every few months Yearly or less	Less than 5 More than 5 but less than 100 More than 100 More than 500	Less than 6 months More than 6 months More than 5 years	Y/N
Impulsive damage to property (e.g., setting fires, damaging or destroying your own or someone else's things).	Y/N	Y/N	Daily Weekly Fortnightly Monthly Every few months Yearly or less	Less than 5 More than 5 but less than 100 More than 100 More than 500	Less than 6 months More than 6 months More than 5 years	Y/N

Responses to Impulsive Behaviours Scale

We are looking at the different emotional responses that individuals may have when they engage in certain behaviours. Some people find that they engage in these kinds of impulsive behaviours when they are feeling stressed, and they may gain a reduction in stress levels either before, during or after engaging in the behaviour. Other people find that they do not associate feeling stressed with these behaviours and have a more positive response.

Thinking about **self-injury and the impulsive behaviours** that you identified earlier (e.g., gambling, binge eating etc.), please indicate how you usually feel before, during and after engaging in following behaviours. **Mark the line with a vertical slash** at the appropriate place.

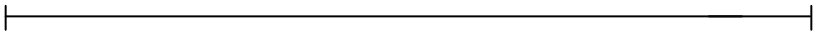
If you have never engaged in one or more of the following behaviours, please leave the item/s blank.

When you engage in **nonsuicidal self-injury**, how do you usually feel?:

Beforehand

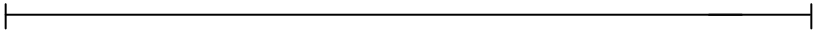
I feel happy and calm

Strongly disagree — Strongly agree



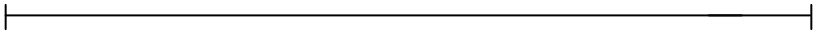
I feel happy and excited

Strongly disagree — Strongly agree



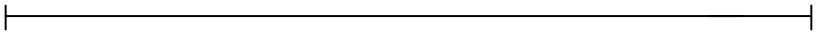
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

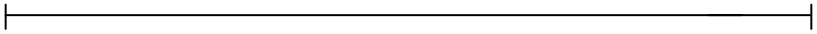
Strongly disagree — Strongly agree



During

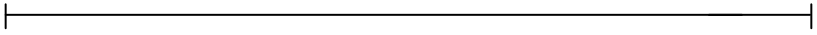
I feel happy and calm

Strongly disagree — Strongly agree



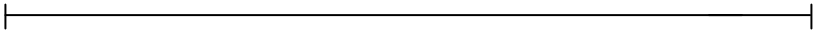
I feel happy and excited

Strongly disagree — Strongly agree



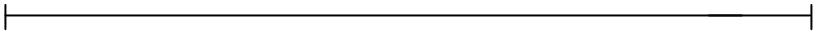
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

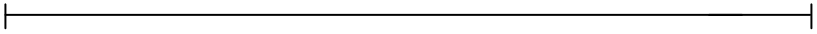
Strongly disagree — Strongly agree



Immediately afterwards

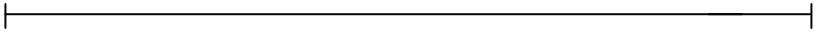
I feel happy and calm

Strongly disagree — Strongly agree



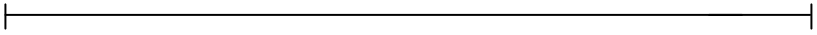
I feel happy and excited

Strongly disagree — Strongly agree



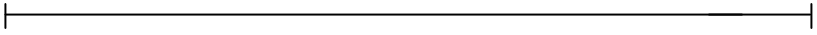
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree

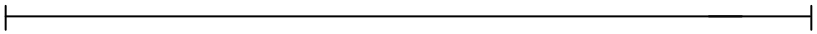


When you engage in **gambling**, how do you usually feel?:

Beforehand

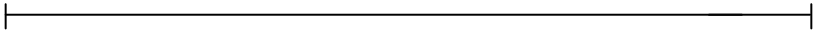
I feel happy and calm

Strongly disagree — Strongly agree



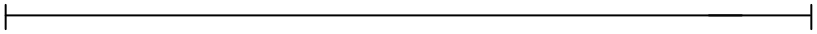
I feel happy and excited

Strongly disagree — Strongly agree



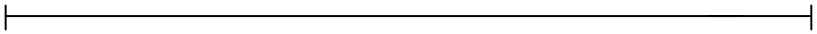
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

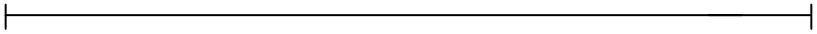
Strongly disagree — Strongly agree



During

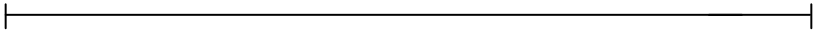
I feel happy and calm

Strongly disagree — Strongly agree



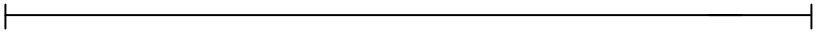
I feel happy and excited

Strongly disagree — Strongly agree



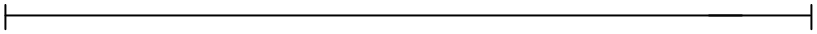
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

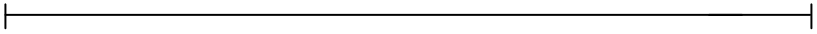
Strongly disagree — Strongly agree



Immediately afterwards

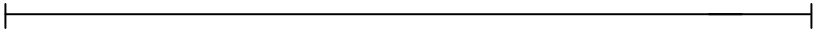
I feel happy and calm

Strongly disagree — Strongly agree



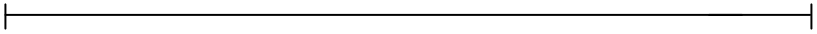
I feel happy and excited

Strongly disagree — Strongly agree



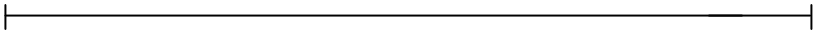
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree

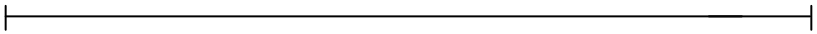


When you engage in **excessive spending**, how do you usually feel?:

Beforehand

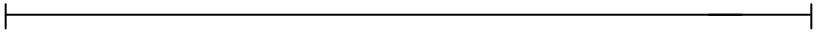
I feel happy and calm

Strongly disagree — Strongly agree



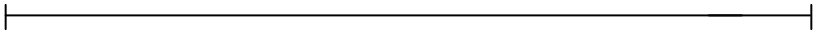
I feel happy and excited

Strongly disagree — Strongly agree



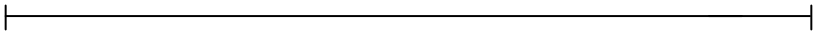
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

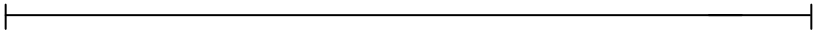
Strongly disagree — Strongly agree



During

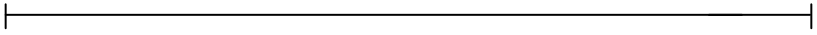
I feel happy and calm

Strongly disagree — Strongly agree



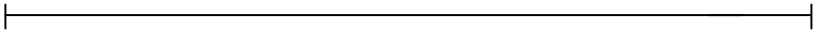
I feel happy and excited

Strongly disagree — Strongly agree



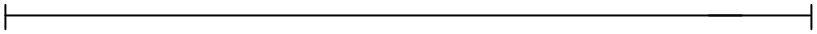
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

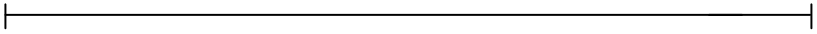
Strongly disagree — Strongly agree



Immediately afterwards

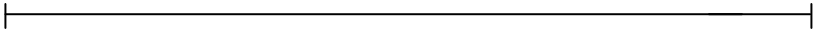
I feel happy and calm

Strongly disagree — Strongly agree



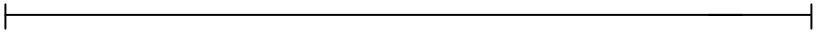
I feel happy and excited

Strongly disagree — Strongly agree



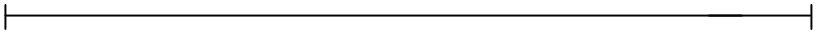
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree

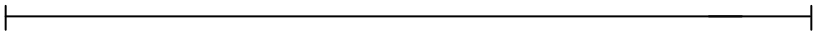


When you engage in **binge eating**, how do you usually feel?:

Beforehand

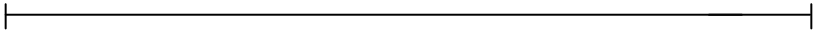
I feel happy and calm

Strongly disagree — Strongly agree



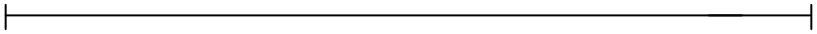
I feel happy and excited

Strongly disagree — Strongly agree



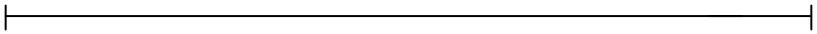
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

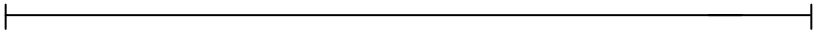
Strongly disagree — Strongly agree



During

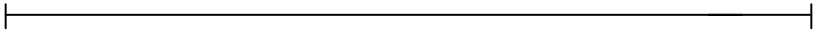
I feel happy and calm

Strongly disagree — Strongly agree



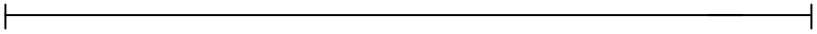
I feel happy and excited

Strongly disagree — Strongly agree



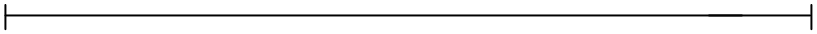
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

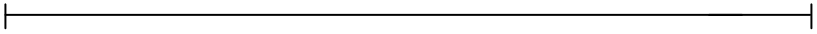
Strongly disagree — Strongly agree



Immediately afterwards

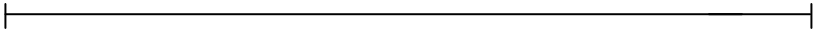
I feel happy and calm

Strongly disagree — Strongly agree



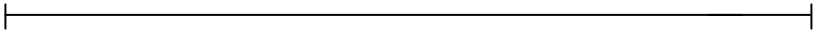
I feel happy and excited

Strongly disagree — Strongly agree



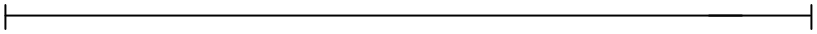
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree

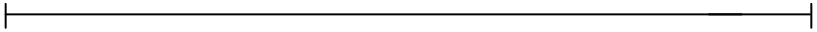


When you engage in **risky sexual activity**, how do you usually feel?:

Beforehand

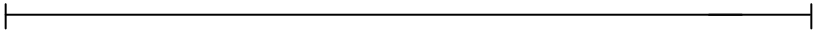
I feel happy and calm

Strongly disagree — Strongly agree



I feel happy and excited

Strongly disagree — Strongly agree

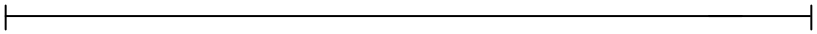


I feel unhappy and sad

Strongly disagree — Strongly agree

I feel unhappy and distressed

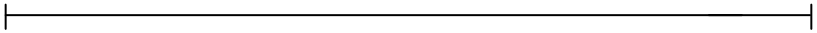
Strongly disagree — Strongly agree



During

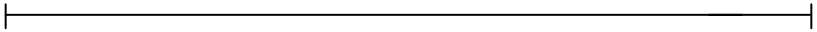
I feel happy and calm

Strongly disagree — Strongly agree



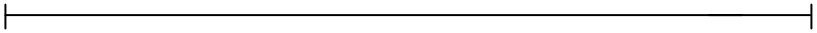
I feel happy and excited

Strongly disagree — Strongly agree



I feel unhappy and sad

Strongly disagree — Strongly agree



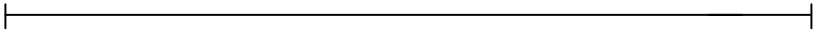
I feel unhappy and distressed

Strongly disagree — Strongly agree

Immediately afterwards

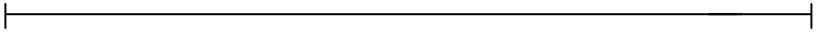
I feel happy and calm

Strongly disagree — Strongly agree



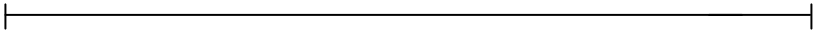
I feel happy and excited

Strongly disagree — Strongly agree



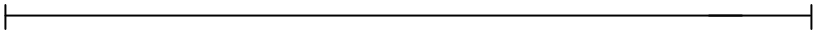
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree

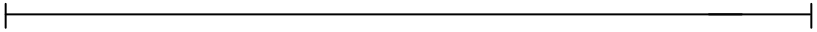


When you engage in **substance use**, how do you usually feel?:

Beforehand

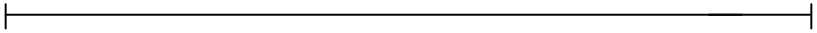
I feel happy and calm

Strongly disagree — Strongly agree



I feel happy and excited

Strongly disagree — Strongly agree

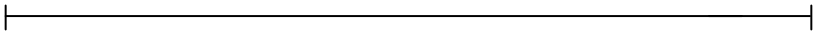


I feel unhappy and sad

Strongly disagree — Strongly agree

I feel unhappy and distressed

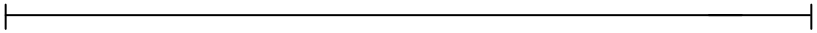
Strongly disagree — Strongly agree



During

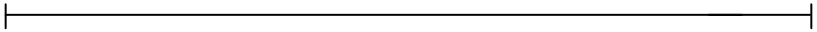
I feel happy and calm

Strongly disagree — Strongly agree



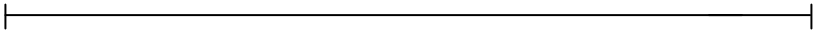
I feel happy and excited

Strongly disagree — Strongly agree



I feel unhappy and sad

Strongly disagree — Strongly agree



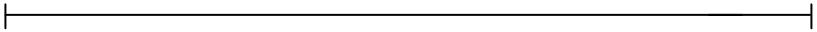
I feel unhappy and distressed

Strongly disagree — Strongly agree

Immediately afterwards

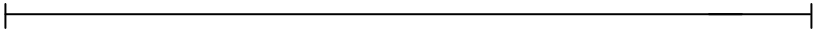
I feel happy and calm

Strongly disagree — Strongly agree



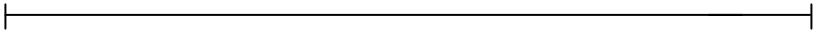
I feel happy and excited

Strongly disagree — Strongly agree



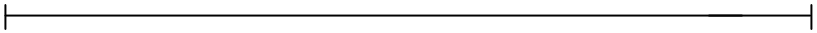
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree

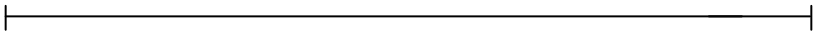


When you engage in **reckless driving**, how do you usually feel?:

Beforehand

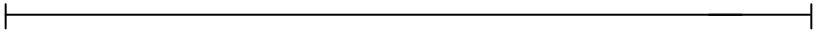
I feel happy and calm

Strongly disagree — Strongly agree



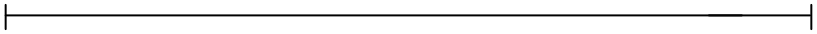
I feel happy and excited

Strongly disagree — Strongly agree



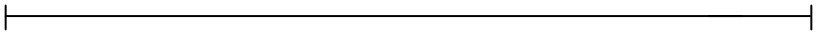
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

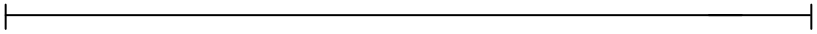
Strongly disagree — Strongly agree



During

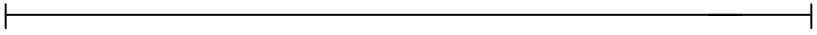
I feel happy and calm

Strongly disagree — Strongly agree



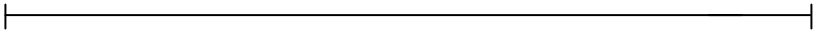
I feel happy and excited

Strongly disagree — Strongly agree



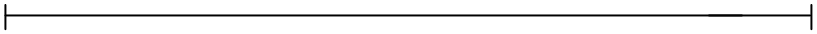
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

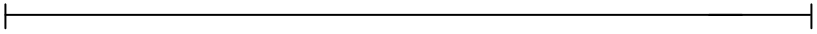
Strongly disagree — Strongly agree



Immediately afterwards

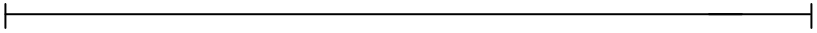
I feel happy and calm

Strongly disagree — Strongly agree



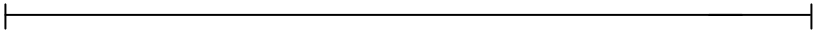
I feel happy and excited

Strongly disagree — Strongly agree



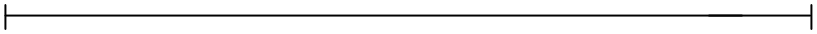
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree

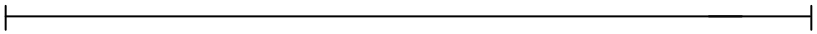


When you engage in **stealing or shoplifting**, how do you usually feel?:

Beforehand

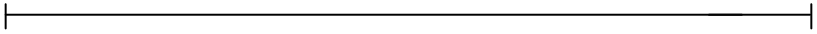
I feel happy and calm

Strongly disagree — Strongly agree



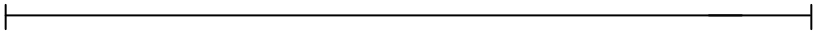
I feel happy and excited

Strongly disagree — Strongly agree



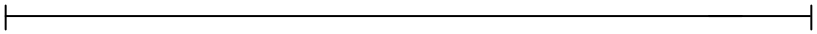
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

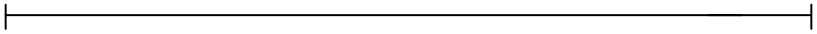
Strongly disagree — Strongly agree



During

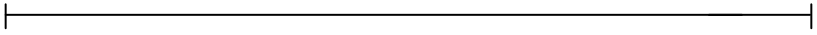
I feel happy and calm

Strongly disagree — Strongly agree



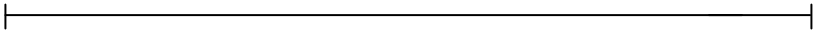
I feel happy and excited

Strongly disagree — Strongly agree



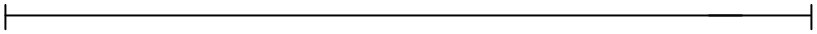
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

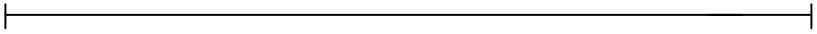
Strongly disagree — Strongly agree



Immediately afterwards

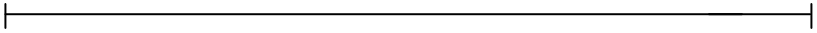
I feel happy and calm

Strongly disagree — Strongly agree



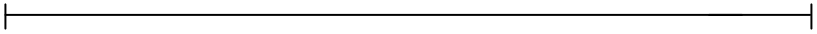
I feel happy and excited

Strongly disagree — Strongly agree



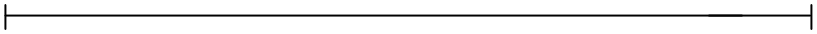
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree

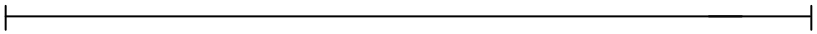


When you engage in **damage to property**, how do you usually feel?:

Beforehand

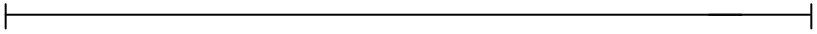
I feel happy and calm

Strongly disagree — Strongly agree



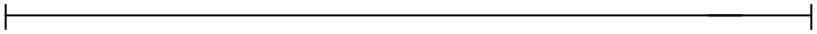
I feel happy and excited

Strongly disagree — Strongly agree



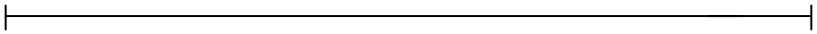
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

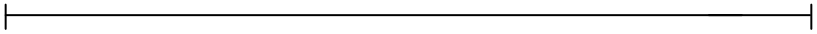
Strongly disagree — Strongly agree



During

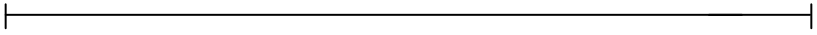
I feel happy and calm

Strongly disagree — Strongly agree



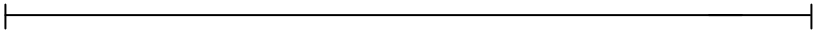
I feel happy and excited

Strongly disagree — Strongly agree



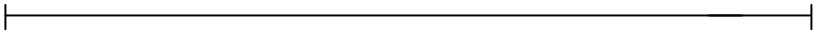
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

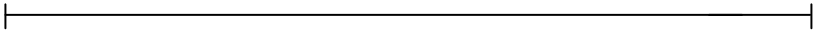
Strongly disagree — Strongly agree



Immediately afterwards

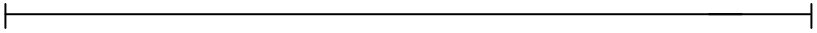
I feel happy and calm

Strongly disagree — Strongly agree



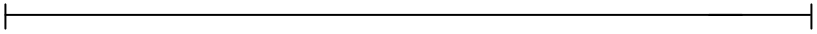
I feel happy and excited

Strongly disagree — Strongly agree



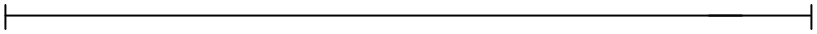
I feel unhappy and sad

Strongly disagree — Strongly agree



I feel unhappy and distressed

Strongly disagree — Strongly agree



This scale looks at people's motivations for engaging in different impulsive behaviours. This scale is **presented twice**, in order to ensure that a wide range of behaviours is assessed. Please pick 2 different behaviours that you have engaged in and complete 1 set of questionnaires for each (e.g., 1 for reckless driving and 1 for binge eating). If you have only engaged in one of these behaviours then you only need to complete the questionnaire once. Similarly, if you did not endorse any impulsive behaviours then you do not need to complete the following scales.

Scale 1: Motivation for Impulsive Behaviours Scale

Please indicate **one** of the following behaviours that you have engaged in:

□ Gambling
□ Excessive shopping
□ Binge eating
□ Impulsive/ risky sexual activities
□ Substance use
□ Reckless driving
□ Stealing
□ Damage to property

Now complete the following scale, in relation to the behaviour that you endorsed

Did You?...		Not at all	A little	A great deal
1	Want to die?	1	2	3
2	Feel that there was no hope?	1	2	3
3	Feel like a failure?	1	2	3
4	Feel that you had let others down?	1	2	3
5	Feel sad?	1	2	3
6	Want to make someone sorry?	1	2	3
7	Feel angry?	1	2	3
8	Think "I'll show him/her"?	1	2	3
9	Think that it would upset someone?	1	2	3
10	Want to teach someone a lesson?	1	2	3
11	Feel lonely?	1	2	3
12	Feel that you weren't needed?	1	2	3
13	Feel that you'd been left out of things?	1	2	3
14	Feel that you'd been hurt?	1	2	3

15	Feel that someone wanted you out of the way?	1	2	3
16	Want someone to be different towards you?	1	2	3
17	Hope that someone would change?	1	2	3
18	Feel that it was the only way to make someone see what they were doing to you?	1	2	3
19	Feel it was a way of making others understand you?	1	2	3
20	Feel you couldn't bear for someone to leave?	1	2	3
21	Think, "if others can do it so can I"?	1	2	3
22	Have anyone in your family speak about engaging in this behaviour?	1	2	3
23	Know anyone else who engaged in this behaviour themselves?	1	2	3
24	Hear about this behaviour on TV, radio, internet, or read about it newspapers or magazines?	1	2	3
25	Think that the fact that others do it affects you?	1	2	3
26	Feel like you just had to get away from it all?	1	2	3
27	Feel you just wanted to die?	1	2	3
28	feel you had to get away while things straightened themselves out?	1	2	3
29	Feel you couldn't put up with it much more?	1	2	3
30	Feel you wanted to leave it to others to sort out?	1	2	3
31	Feel so tense you had to do something?	1	2	3
32	Feel anxious and feel like it was the only way of coping?	1	2	3
33	Feel like everything seemed not quite real before you did it?	1	2	3
34	Feel less anxious after you had done it?	1	2	3
35	Feel you didn't really care if you lived or died?	1	2	3
36	Feel uncertain if you wanted to live or die?	1	2	3
37	Feel you would take a chance on whether you lived or died?	1	2	3
38	Feel you wanted to live, but also wanted to die?	1	2	3
39	Feel that it didn't matter if you lived or died?	1	2	3

40	Feel that you deserved to be punished?	1	2	3
41	Feel guilty?	1	2	3
42	Feel like you hated yourself?	1	2	3
43	Feel that you were a bad and worthless person?	1	2	3
44	Feel that you had to punish yourself for something you had done?	1	2	3

Scale 2

The same scale is presented again. This time, please indicate **one** of the following behaviours that you have engaged in. This needs to be a **different behaviour from the one that you previously selected**.

□ Gambling
□ Excessive shopping
□ Binge eating
□ Impulsive/ risky sexual activities
□ Substance use
□ Reckless driving
□ Stealing
□ Damage to property

Now complete the same scale again, in relation to this second behaviour that you have endorsed

Did You?...		Not at all	A little	A great deal
1	Want to die?	1	2	3
2	Feel that there was no hope?	1	2	3
3	Feel like a failure?	1	2	3
4	Feel that you had let others down?	1	2	3
5	Feel sad?	1	2	3
6	Want to make someone sorry?	1	2	3
7	Feel angry?	1	2	3
8	Think “I’ll show him/her”?	1	2	3
9	Think that it would upset someone?	1	2	3
10	Want to teach someone a lesson?	1	2	3

11	Feel lonely?	1	2	3
12	Feel that you weren't needed?	1	2	3
13	Feel that you'd been left out of things?	1	2	3
14	Feel that you'd been hurt?	1	2	3
15	Feel that someone wanted you out of the way?	1	2	3
16	Want someone to be different towards you?	1	2	3
17	Hope that someone would change?	1	2	3
18	Feel that it was the only way to make someone see what they were doing to you?	1	2	3
19	Feel it was a way of making others understand you?	1	2	3
20	Feel you couldn't bear for someone to leave?	1	2	3
21	Think, "if others can do it so can I"?	1	2	3
22	Have anyone in your family speak about engaging in this behaviour?	1	2	3
23	Know anyone else who engaged in this behaviour themselves?	1	2	3
24	Hear about this behaviour on TV, radio, internet, or read about it newspapers or magazines?	1	2	3
25	Think that the fact that others do it affects you?	1	2	3
26	Feel like you just had to get away from it all?	1	2	3
27	Feel you just wanted to die?	1	2	3
28	feel you had to get away while things straightened themselves out?	1	2	3

29	Feel you couldn't put up with it much more?	1	2	3
30	Feel you wanted to leave it to others to sort out?	1	2	3
31	Feel so tense you had to do something?	1	2	3
32	Feel anxious and feel like it was the only way of coping?	1	2	3
33	Feel like everything seemed not quite real before you did it?	1	2	3
34	Feel less anxious after you had done it?	1	2	3
35	Feel you didn't really care if you lived or died?	1	2	3
36	Feel uncertain if you wanted to live or die?	1	2	3
37	Feel you would take a chance on whether you lived or died?	1	2	3
38	Feel you wanted to live, but also wanted to die?	1	2	3
39	Feel that it didn't matter if you lived or died?	1	2	3
40	Feel that you deserved to be punished?	1	2	3
41	Feel guilty?	1	2	3
42	Feel like you hated yourself?	1	2	3
43	Feel that you were a bad and worthless person?	1	2	3
44	Feel that you had to punish yourself for something you had done?	1	2	3

APPENDIX F

Descriptive statistics for Study 2

Psychophysiological data (heart rate)

Table 39

Means and standard deviations for heart rate (beats per minute) for each stage of each script for the BPD and NBPD groups

Script	*Scene*		*Approach*		*Incident*		*Consequence*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
NSSI								
BPD	73.8	11.6	75.5	12.9	78.1	12.5	75.2	11.2
NBPD	80.0	12.9	80.6	12.1	78.2	12.0	77.3	11.8
Accidental injury								
BPD	74.4	13.5	73.4	15.7	76.1	14.6	74.7	14.9
NBPD	77.6	12.3	77.8	11.9	79.0	11.5	78.9	13.2
Neutral								
BPD	73.0	13.2	70.5	12.6	71.9	12.4	70.9	12.3
NBPD	76.4	11.6	77.0	11.6	76.3	11.8	76.9	11.0
Impulsive								
BPD	74.5	18.5	76.0	12.2	75.8	12.9	75.0	11.2
NBPD	77.7	11.2	77.9	12.3	77.1	12.0	77.6	11.3

Psychological data (responses to imagery on VAS items)

Script x Stage x Group Means and Standard Deviations

Table 40

Mean scores and standard deviations for the VAS measures for each stage of each script for BPD and NBPD participants

VAS Item	*Scene*		*Approach*		*Incident*		*Consequence*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Tense								
NSSI								
BPD	81.6	23.9	81.3	23.3	70.4	30.9	32.5	37.2
NBPD	72.8	28.4	69.0	32.6	69.1	28.9	38.3	30.9
Accidental injury								
BPD	25.8	31.8	30.6	30.5	54.7	39.4	43.7	34.6
NBPD	23.5	22.2	34.6	29.5	72.1	32.7	65.0	30.9
Neutral								
BPD	13.4	19.6	10.9	15.3	8.4	13.5	7.1	9.8
NBPD	9.0	10.9	8.9	11.8	9.1	11.9	14.0	22.3
Impulsive								
BPD	49.8	38.5	51.0	35.7	43.5	39.5	35.4	40.5
NBPD	57.2	34.9	53.3	33.8	59.5	30.0	52.4	33.7
Anxious								
NSSI								
BPD	77.4	28.3	80.9	23.1	75.4	27.5	31.1	34.5
NBPD	70.5	28.3	70.9	32.8	65.3	32.4	42.5	34.2
Accidental injury								
BPD	24.4	24.9	27.5	29.5	53.4	41.8	52.2	34.2
NBPD	23.8	27.1	36.4	29.3	67.5	33.8	64.4	31.6
Neutral								
BPD	16.8	21.1	14.2	17.2	8.8	11.8	6.6	8.7
NBPD	8.3	10.6	8.2	11.0	7.4	9.5	14.1	22.3

Impulsive								
BPD	48.3	35.7	55.1	35.4	49.2	38.3	43.2	40.4
NBPD	57.8	35.7	53.7	34.8	56.8	29.1	56.0	34.5
Anger								
NSSI								
BPD	70.1	38.9	62.9	38.5	59.0	40.4	30.8	35.5
NBPD	66.9	29.1	64.2	34.2	58.0	35.5	38.5	34.5
Accidental injury								
BPD	11.2	22.1	13.9	18.0	45.6	39.8	27.2	34.5
NBPD	15.4	20.9	17.6	22.7	42.9	35.9	36.8	33.9
Neutral								
BPD	4.3	4.9	3.0	4.2	4.4	7.8	3.6	5.1
NBPD	6.2	8.1	7.6	10.3	6.4	8.9	10.2	20.6
Impulsive								
BPD	39.2	37.4	40.0	40.0	34.5	38.7	41.4	39.2
NBPD	34.5	35.1	35.9	35.9	33.7	33.5	37.8	34.0
Fear								
NSSI								
BPD	49.5	43.0	42.5	39.7	43.8	34.3	37.9	38.2
NBPD	50.9	31.5	48.5	36.8	42.9	36.1	40.1	37.0
Accidental injury								
BPD	6.4	7.5	15.3	20.8	43.8	39.8	28.8	34.3
NBPD	17.3	19.9	33.6	34.9	52.6	36.7	54.6	36.6
Neutral								
BPD	3.3	4.1	2.5	3.7	3.9	7.5	2.7	3.8
NBPD	7.8	9.9	5.1	5.9	8.0	18.0	10.4	21.3
Impulsive								
BPD	26.4	30.2	34.7	32.8	34.6	37.2	34.5	27.6
NBPD	31.9	32.1	33.4	34.7	42.0	31.2	53.3	32.3
Unhappiness								
NSSI								
BPD	77.9	30.5	79.6	29.5	77.8	32.0	59.6	38.6
NBPD	82.2	16.6	73.4	30.4	65.8	39.1	61.0	29.2
Accidental injury								
BPD	25.4	32.0	32.5	33.9	62.7	29.7	47.1	33.7
NBPD	28.7	24.6	32.0	24.5	72.6	24.9	69.9	27.5
Neutral								
BPD	25.1	18.8	23.1	18.3	21.2	19.7	17.2	19.2
NBPD	18.6	15.5	23.2	23.6	18.7	17.2	20.7	19.0

Impulsive								
BPD	55.2	37.5	58.6	34.6	48.4	38.6	61.4	37.3
NBPD	55.7	37.1	50.4	38.6	48.2	33.7	46.4	33.0
Calm								
NSSI								
BPD	20.9	26.8	27.9	40.8	30.2	63.9	58.7	35.7
NBPD	27.9	32.2	21.5	24.5	23.3	32.7	28.6	33.5
Accidental injury								
BPD	62.8	34.5	59.1	26.5	34.4	34.4	51.0	34.0
NBPD	65.9	28.4	67.9	24.2	36.6	30.9	38.3	32.9
Neutral								
BPD	84.9	12.1	86.5	15.2	81.8	17.6	89.4	11.4
NBPD	88.5	14.9	88.4	13.3	88.2	14.9	87.9	14.8
Impulsive								
BPD	50.1	34.0	48.9	37.0	60.1	37.5	52.2	37.5
NBPD	44.7	38.7	53.9	35.7	54.8	32.7	55.1	32.1
Relief								
NSSI								
BPD	13.3	25.2	13.1	17.3	43.7	30.1	69.9	36.4
NBPD	21.4	23.1	20.3	23.2	48.3	29.3	63.6	36.3
Accidental injury								
BPD	42.3	29.0	41.7	30.3	23.9	30.1	48.0	37.0
NBPD	59.9	31.8	52.0	29.7	31.0	29.0	31.1	30.8
Neutral								
BPD	52.1	26.8	53.1	26.7	51.5	30.9	69.6	33.5
NBPD	70.1	31.0	72.0	30.8	73.2	30.9	70.4	30.8
Impulsive								
BPD	31.3	30.2	32.9	32.9	60.2	41.7	51.6	38.4
NBPD	38.1	36.6	49.4	36.5	54.9	31.7	52.6	36.8
Excitement								
NSSI								
BPD	28.4	29.0	26.8	28.8	29.0	32.9	21.3	18.4
NBPD	13.2	25.2	28.6	33.7	32.9	36.3	21.2	29.6
Accidental injury								
BPD	48.6	33.4	48.3	31.7	29.6	30.2	28.4	28.9
NBPD	54.1	35.6	48.5	36.2	27.1	31.5	28.8	33.9

Neutral								
BPD	32.3	33.7	38.1	36.3	32.7	33.4	32.1	32.6
NBPD	30.8	23.0	37.1	24.9	30.7	29.3	47.2	29.7
Impulsive								
BPD	45.7	35.6	46.0	38.1	54.7	37.9	47.2	39.2
NBPD	40.4	35.5	43.9	36.1	60.8	37.6	35.7	31.5
Agitation								
NSSI								
BPD	66.2	29.1	64.8	34.8	53.2	38.7	35.9	35.3
NBPD	69.6	35.6	68.6	34.8	51.7	38.2	34.3	33.6
Accidental injury								
BPD	36.2	31.0	29.5	29.8	58.6	29.9	50.5	32.4
NBPD	26.5	31.1	23.7	27.6	67.1	33.6	54.0	39.7
Neutral								
BPD	5.7	7.0	7.9	12.6	5.5	8.0	6.6	9.6
NBPD	6.9	7.4	6.2	8.0	7.1	10.3	2.9	2.7
Impulsive								
BPD	41.8	37.0	35.4	35.3	32.7	30.6	43.4	38.4
NBPD	43.0	35.4	35.7	38.5	30.5	38.6	50.4	44.8
Unreality								
NSSI								
BPD	42.4	34.9	43.9	33.0	51.9	34.3	46.1	34.2
NBPD	39.1	35.3	48.9	40.4	52.5	36.7	48.0	43.2
Accidental injury								
BPD	15.7	18.5	20.0	25.2	32.6	30.0	27.9	31.9
NBPD	7.7	10.4	12.6	23.1	29.6	36.0	17.7	30.9
Neutral								
BPD	9.9	14.7	15.8	23.1	8.9	10.5	9.1	10.5
NBPD	5.2	6.7	6.8	12.1	8.8	15.8	3.9	5.4
Impulsive								
BPD	33.2	31.2	30.0	30.7	40.6	35.2	46.9	35.8
NBPD	35.1	35.8	44.4	33.8	40.2	37.8	44.3	37.2
Numb								
NSSI								
BPD	38.6	35.6	40.6	35.4	54.1	33.0	57.0	30.7
NBPD	40.0	39.3	50.2	39.6	54.2	39.5	55.2	43.6
Accidental injury								
BPD	19.8	22.9	21.0	25.6	26.1	25.9	30.6	29.8
NBPD	5.6	11.1	14.7	25.0	26.9	34.0	22.0	34.9

Neutral								
BPD	10.9	14.6	11.2	15.3	11.0	15.6	10.5	13.5
NBPD	11.4	20.5	8.7	17.1	9.0	19.3	5.0	6.7
Impulsive								
BPD	34.2	33.3	30.1	30.8	43.8	35.1	51.8	34.3
NBPD	33.6	36.8	37.3	39.0	39.2	38.7	35.0	34.9
Risk to life								
NSSI								
BPD	27.6	28.1	30.2	31.0	36.4	33.1	26.1	32.4
NBPD	25.9	28.5	24.0	27.5	36.4	38.5	28.0	36.2
Accidental injury								
BPD	15.4	25.1	16.7	24.9	27.5	32.2	24.2	31.7
NBPD	4.1	4.5	12.9	24.1	23.3	35.1	19.0	32.5
Neutral								
BPD	8.5	19.4	5.9	7.6	5.3	6.4	4.7	5.2
NBPD	2.2	3.0	2.4	3.6	2.2	7.8	7.3	21.7
Impulsive								
BPD	19.9	27.4	18.4	29.7	30.1	36.0	30.9	38.0
NBPD	13.0	24.1	19.8	28.8	20.4	29.4	16.8	29.5
Control								
NSSI								
BPD	46.1	31.6	48.5	36.6	53.9	38.3	54.7	35.7
NBPD	39.4	34.4	61.0	36.9	54.9	37.0	52.1	39.6
Accidental injury								
BPD	70.9	36.4	71.4	27.4	44.0	31.8	39.7	32.7
NBPD	85.4	29.1	78.4	31.7	63.5	33.0	69.5	36.8
Neutral								
BPD	92.5	8.9	90.6	12.0	86.6	21.3	84.0	27.7
NBPD	89.0	23.5	88.3	23.0	92.4	11.4	90.5	21.7
Impulsive								
BPD	62.5	35.0	57.2	39.0	51.9	34.2	41.9	37.6
NBPD	64.0	35.6	57.5	32.8	51.3	40.1	48.2	36.4
Clear								
NSSI								
BPD	82.9	16.9	86.9	12.2	86.1	18.6	81.9	20.0
NBPD	86.7	16.7	90.5	14.0	83.3	28.6	87.1	23.4

Accidental injury								
BPD	83.7	15.0	80.6	19.2	78.9	25.1	79.6	19.8
NBPD	87.5	14.8	87.2	15.8	93.1	9.1	93.4	8.0
Neutral								
BPD	90.2	9.8	89.1	10.5	88.6	11.0	87.9	11.7
NBPD	86.8	16.4	83.9	18.1	86.6	16.8	86.7	18.4
Impulsive								
BPD	80.4	19.9	81.5	20.5	82.4	17.2	77.9	25.5
NBPD	82.1	19.3	75.4	27.5	83.9	24.3	84.1	24.1
Close								
NSSI								
BPD	81.6	16.9	80.9	19.4	85.1	22.2	80.7	21.7
NBPD	87.9	14.9	90.7	10.9	90.2	12.7	87.2	18.4
Accidental injury								
BPD	81.0	18.5	80.2	18.6	80.4	23.3	78.4	21.5
NBPD	89.6	14.0	90.4	12.2	92.9	10.6	91.5	18.9
Neutral								
BPD	89.8	11.3	90.1	11.4	90.9	8.8	89.8	10.9
NBPD	87.5	16.1	88.6	15.0	90.9	13.5	89.6	12.9
Impulsive								
BPD	81.0	19.6	82.3	17.0	81.9	19.0	79.8	23.5
NBPD	83.6	18.7	75.3	28.4	88.1	19.4	88.4	13.9

Descriptive statistics for Script x Stage

Table 41

Means and standard deviations for VAS items comparing script by stage

VAS Item	*Scene*		*Approach*		*Incident*		*Consequence*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Tense								
NSSI	77.0	26.4	74.9	28.9	69.7	29.5	35.5	33.8
Accidental injury	22.9	28.5	32.7	29.7	63.8	36.6	54.9	34.1
Neutral	11.1	15.6	9.9	13.4	8.8	12.5	10.8	17.7
Impulsive	53.7	36.4	52.2	34.3	51.9	35.3	44.3	37.6
Anxious								
NSSI	73.8	28.2	75.7	28.7	70.1	30.2	37.1	34.4
Accidental injury	24.1	27.6	32.2	29.4	60.8	38.0	58.6	33.0
Neutral	12.4	16.8	11.1	14.4	8.1	10.5	10.5	17.4
Impulsive	53.3	35.6	54.4	34.6	53.2	33.6	49.9	37.5
Anger								
NSSI	68.4	33.7	63.6	35.9	58.5	37.4	34.8	34.8
Accidental injury	13.4	21.3	15.9	20.4	44.2	37.3	32.2	34.1
Neutral	5.3	6.7	5.4	8.2	5.4	8.4	7.1	15.5
Impulsive	36.8	35.8	37.9	37.5	34.1	35.6	39.5	36.2
Fear								
NSSI	50.2	36.9	45.6	37.8	43.3	34.8	39.0	37.2
Accidental injury	12.1	16.1	24.9	30.2	48.4	38.0	42.2	37.4
Neutral	5.7	7.9	3.9	5.1	6.1	14.0	7.8	15.9
Impulsive	29.3	31.0	34.0	34.4	38.5	34.0	44.5	35.8
Unhappy								
NSSI	80.2	24.1	76.4	29.8	71.5	31.7	60.3	33.6
Accidental injury	27.1	28.0	32.2	29.0	67.9	27.4	59.0	32.3
Neutral	27.1	17.3	23.2	21.2	19.9	18.2	19.0	19.0
Impulsive	55.5	36.8	54.3	36.5	48.3	35.6	53.5	35.5
Calm								
NSSI	24.7	29.6	22.9	25.5	37.1	29.9	61.5	31.1
Accidental injury	64.5	30.9	63.9	25.3	35.6	32.1	44.1	33.1
Neutral	86.9	13.6	87.5	14.0	85.3	16.3	88.6	13.2
Impulsive	47.2	36.2	51.6	35.9	57.2	34.5	53.8	34.2

Relief								
NSSI	17.7	24.1	17.0	20.7	46.2	29.3	66.5	36.0
Accidental injury	51.9	31.4	47.3	30.0	27.8	29.3	38.8	34.3
Neutral	61.9	30.1	63.4	30.1	63.3	32.3	70.0	31.6
Impulsive	35.0	33.5	41.9	35.4	57.3	36.2	52.1	34.9
Excitement								
NSSI	21.5	28.0	27.7	30.6	30.8	33.6	21.2	23.8
Accidental injury	51.1	34.0	48.9	33.3	28.5	30.3	28.6	30.8
Neutral	31.6	28.9	37.6	31.2	31.8	31.2	39.0	31.8
Impulsive	43.3	35.1	45.1	36.7	47.5	37.1	41.9	35.9
Agitation								
NSSI	67.7	31.8	66.5	34.3	52.5	37.9	35.2	34.0
Accidental injury	26.3	30.6	26.9	28.5	62.5	31.4	52.1	35.5
Neutral	6.2	7.1	7.1	10.6	6.3	9.0	4.9	7.5
Impulsive	42.3	35.8	35.6	36.2	31.7	34.0	46.6	40.9
Unreality								
NSSI	40.9	34.7	46.3	36.3	52.2	35.0	47.0	38.3
Accidental injury	11.9	15,5	16.5	24.2	31.2	32.6	23.1	31.5
Neutral	7.7	11.7	11.5	19.0	8.9	13.1	6.7	8.8
Impulsive	34.1	33.1	36.9	32.6	40.4	36.0	45.7	36.1
Numb								
NSSI	39.3	37.0	45.2	37.3	54.1	35.8	56.2	36.9
Accidental injury	13.1	19.4	18.0	25.3	26.5	29.2	26.5	32.2
Neutral	11.2	17.5	10.0	16.0	10.1	17.3	7.9	11.0
Impulsive	33.9	34.6	33.5	34.7	41.6	36.5	43.8	35.2
Control								
NSSI	42.9	32.7	54.4	36.9	54.4	37.2	53.4	37.2
Accidental injury	77.8	33.6	74.7	29.4	53.3	33.4	53.9	37.5
Neutral	90.9	17.3	89.5	17.9	89.4	17.3	87.1	24.3
Impulsive	62.0	34.9	57.4	35.7	51.6	36.6	44.9	36.7

Motivational responses (MIBS)

Table 42

Motivation for Impulsive Behaviours I (MIBS-I)

Motivation		Group BPD	Group NBPD	Analysis
Depression	M	10.3	10.3	$t(40) = .1$, $p<.05$
	SD	3.6	3.1	
Extrapunitive	M	7.0	8.2	$t(40) = 1.2$, $p>.05$
	SD	2.6	3.3	
Alienation	M	9.4	9.8	$t(40) = .4$, $p>.05$
	SD	3.2	3.2	
Operant	M	6.5	7.4	$t(40) = 1.1$, $p>.05$
	SD	2.7	2.8	
Modelling	M	8.6	8.7	$t(40) = .2$, $p>.05$
	SD	2.4	1.9	
Avoidance	M	9.4	10.5	$t(40) = 1.1$, $p>.05$
	SD	3.4	3.2	
Tension Reduction	M	8.0	8.7	$t(40) = .9$, $p>.05$
	SD	2.6	2.3	
Janus Face	M	8.9	8.0	$t(40) = .8$, $p>.05$
	SD	3.8	3.0	
Intropunitive	M	9.1	9.9	$t(40) = .7$, $p>.05$
	SD	3.3	3.7	

Motivational responses continued (MIBS-II)

Table 43

Motivation for Impulsive Behaviours II (MIBS-II)

Motivation		Group BPD	Group NBPD	Analysis
Depression	M	8.5	9.2	$t(40) = .6$, $p<.05$
	SD	3.8	3.3	
Extrapunitive	M	7.5	8.9	$t(40) = .2$, $p>.05$
	SD	3.3	3.8	
Alienation	M	8.2	9.8	$t(40) = 1.4$, $p>.05$
	SD	3.2	3.7	
Operant	M	6.9	8.2	$t(40) = 1.1$, $p>.05$
	SD	3.0	3.6	
Modelling	M	8.5	8.6	$t(40) = .1$, $p>.05$
	SD	2.4	2.6	
Avoidance	M	8.2	8.8	$t(40) = .5$, $p>.05$
	SD	2.9	3.3	
Tension Reduction	M	7.7	8.2	$t(40) = .6$, $p>.05$
	SD	2.4	2.9	
Janus Face	M	7.1	8.2	$t(40) = .3$, $p>.05$
	SD	2.6	2.9	
Intropunitive	M	8.4	9.5	$t(40) = .9$, $p>.05$
	SD	3.5	3.8	

Responses to Impulsive Behaviours (RIBS)

Table 44

Means and standard deviations for reaction by stage by group for RIBS

RIBS Item	*Before*		*During*		*After*	
	M	**SD**	**M**	**SD**	**M**	**SD**
NSSI						
Calm						
BPD	5.7	6.8	37.3	29.9	56.5	38.4
NBPD	7.4	12.4	31.2	30.0	48.8	40.5
Excited						
BPD	14.3	22.1	37.1	30.0	39.6	34.1
NBPD	7.3	13.1	19.1	26.8	21.7	32.2
Sad						
BPD	75.8	33.8	48.1	34.8	43.1	35.2
NBPD	89.0	15.3	53.5	32.9	42.2	34.6
Distressed						
BPD	82.2	31.0	39.3	35.8	38.4	34.7
NBPD	88.3	18.4	51.3	37.4	42.4	33.8
Gambling						
Calm						
BPD	72.4	20.2	68.7	23.3	69.1	17.0
NBPD	73.9	15.6	74.9	18.6	62.2	17.3
Excited						
BPD	72.6	23.6	76.5	24.6	53.2	5.8
NBPD	83.0	6.9	83.2	6.2	59.5	22.7
Sad						
BPD	15.6	14.9	22.7	16.6	34.7	21.8
NBPD	13.7	12.8	13.5	9.6	31.9	27.1
Distressed						
BPD	51.1	15.5	15.7	18.4	23.5	28.4
NBPD	11.5	11.7	10.3	8.3	26.7	26.1
Spending						
Calm						
BPD	52.7	30.5	54.9	29.6	51.7	30.2
NBPD	42.3	32.0	50.5	30.5	34.5	35.0

Excited						
BPD	56.4	33.1	74.9	27.2	51.6	33.3
NBPD	49.1	36.1	63.9	31.0	53.8	38.6
Sad						
BPD	40.6	28.8	29.0	23.6	44.6	29.8
NBPD	31.1	23.0	14.9	18.6	31.6	35.4
Distressed						
BPD	32.7	28.6	22.4	21.9	46.0	31.8
NBPD	31.8	21.4	16.4	16.1	39.2	37.9
Binge						
Calm						
BPD	31.2	33.6	67.4	30.9	40.7	38.0
NBPD	22.6	29.2	48.7	27.2	47.8	40.1
Excited						
BPD	29.0	33.3	33.1	35.2	22.7	32.8
NBPD	21.1	29.4	29.3	30.2	24.6	33.0
Sad						
BPD	71.5	34.5	40.0	29.4	62.5	39.8
NBPD	75.3	30.2	39.6	31.0	40.6	28.7
Distressed						
BPD	68.0	34.3	38.8	32.1	60.9	38.9
NBPD	71.7	31.5	38.9	30.5	37.2	29.6
Risky sex						
Calm						
BPD	52.0	26.4	48.3	30.5	51.9	27.5
NBPD	39.8	28.6	39.8	30.1	49.0	31.9
Excited						
BPD	78.6	17.3	76.9	24.6	48.8	34.5
NBPD	55.2	26.3	54.9	30.0	49.8	30.1
Sad						
BPD	35.6	26.7	21.0	25.7	57.2	35.3
NBPD	34.8	18.0	36.7	22.3	49.5	31.6
Distressed						
BPD	30.2	27.2	20.0	25.9	54.3	35.1
NBPD	32.4	19.6	39.3	26.7	51.6	30.7
Substance						
Calm						
BPD	34.2	37.0	83.4	19.8	66.6	35.3
NBPD	34.6	34.2	65.3	27.4	64.5	31.3
Excited						
BPD	38.2	40.1	79.7	29.5	54.6	37.7
NBPD	47.5	36.9	64.7	35.5	41.6	30.1

Sad						
BPD	54.2	39.8	17.6	29.0	22.2	31.9
NBPD	58.2	29.3	29.0	30.0	29.0	29.2
Distressed						
BPD	56.3	43.9	15.1	26.6	18.2	29.9
NBPD	61.2	28.3	26.4	25.9	23.6	27.1
Drive						
Calm						
BPD	16.3	20.3	22.1	29.0	35.7	36.9
NBPD	40.8	31.2	34.2	28.5	43.8	28.0
Excited						
BPD	14.2	18.5	40.8	37.3	47.8	32.4
NBPD	47.7	26.5	45.0	40.6	32.1	20.4
Sad						
BPD	49.1	30.1	32.6	33.1	37.9	40.7
NBPD	70.2	27.9	49.1	30.1	49.6	33.4
Distressed						
BPD	83.6	14.8	42.7	30.1	38.3	39.9
NBPD	67.9	14.3	51.7	36.6	50.9	35.0
Steal						
Calm						
BPD	30.7	24.2	13.7	13.9	43.0	38.5
NBPD	24.9	17.6	29.5	30.7	46.4	28.7
Excited						
BPD	79.2	22.8	79.6	32.5	86.4	16.8
NBPD	44.5	34.8	61.3	36.6	51.4	32.6
Sad						
BPD	25.3	29.6	15.9	20.2	19.4	22.7
NBPD	32.3	28.3	26.8	31.7	24.9	31.3
Distressed						
BPD	23.0	27.6	24.0	33.1	17.6	23.0
NBPD	39.5	29.8	38.1	37.5	35.7	33.2

Table 45

Means and Standard deviations for reactions to stealing

Emotional response	***Descriptive***	
	M	**SD**
Calm	31.4	27.5
Excited	67.0	27.5
Sad	24.1	26.5
Distressed	29.7	30.3

Responses to Impulsive Behaviours (RIBS) continued

RIBS Reactions by stage means and standard deviations

Table 46

Means and standard deviations for reaction by stage

RIBS Item	*Before* M	SD	*During* M	SD	*After* M	SD
NSSI						
Calm	6.6	10.1	34.1	29.7	52.4	39.2
Excited	10.5	18.3	27.4	29.3	30.0	33.9
Sad	82.9	26.1	51.0	33.4	42.6	34.5
Distressed	85.5	24.9	45.7	36.7	40.5	33.8
Gambling						
Calm	73.2	17.1	72.0	20.3	65.4	16.8
Excited	78.2	16.9	80.1	16.8	56.6	16.8
Sad	14.6	13.2	17.7	13.6	33.2	23.8
Distressed	13.1	13.1	12.8	13.6	25.3	22.7
Spending						
Calm	49.0	30.8	53.3	29.4	45.5	32.4
Excited	53.8	34.9	70.9	28.5	52.4	34.5
Sad	37.2	26.8	23.9	22.6	39.9	31.8
Distressed	32.4	25.8	20.2	19.9	43.5	33.5
Binge						
Calm	27.7	31.6	59.7	30.4	43.6	38.3
Excited	25.7	31.5	43.3	34.8	23.3	33.1
Sad	73.1	32.3	39.9	29.5	53.4	36.8
Distressed	69.5	32.6	38.9	30.9	51.1	36.7
Risky sex						
Calm						
Excited		N/A		N/A		
Sad						
Distressed						

Substance						
Calm	34.4	34.8	73.4	25.6	65.4	32.5
Excited	43.3	38.0	71.4	33.2	47.4	33.7
Sad	56.4	33.8	23.9	28.5	25.9	30.0
Distressed	59.0	35.5	21.3	26.4	21.1	27.1
Drive						
Calm	26.5	27.2	27.1	28.2	39.1	32.3
Excited	28.1	27.2	42.5	36.9	41.2	28.1
Sad	69.5	21.7	39.5	31.6	42.8	36.7
Distressed	77.0	16.1	46.4	31.6	43.6	36.8
Steal						
Calm						
Excited		N/A			N/A	
Sad						
Distressed						

Responses to Impulsive Behaviours (RIBS) continued

Descriptive statistics for NSSI x gambling, spending binge eating sex, substance use and stealing

Table 47

Means and Standard deviations for NSSI by Impulsive behaviour

RIBS Item	*Before*		*During*		*After*	
	M	**SD**	**M**	**SD**	**M**	**SD**
Gambling						
Calm						
NSSI	8.8	7.3	24.7	23.0	45.3	40.4
Impulsive	73.2	17.1	72.0	20.3	65.4	16.8
Excited						
NSSI	8.8	7.3	24.7	23.0	45.3	40.4
Impulsive	78.2	16.9	80.1	16.8	56.6	16.8
Sad						
NSSI	8.8	7.3	24.7	23.0	45.3	40.4
Impulsive	14.6	13.2	17.7	13.6	33.2	23.8
Distressed						
NSSI	8.8	7.3	24.7	23.0	45.3	40.4
Impulsive	13.1	13.1	12.8	13.6	25.3	22.7
Spending						
Calm						
NSSI	6.2	7.0	36.4	27.5	61.1	36.4
Impulsive	49.0	30.8	53.3	29.4	45.5	32.4
Excited						
NSSI	6.2	7.0	36.4	27.5	61.1	36.4
Impulsive	53.8	34.9	70.9	28.5	52.4	34.5
Sad						
NSSI	6.2	7.0	36.4	27.5	61.1	36.4
Impulsive	37.2	26.8	23.9	22.6	39.9	31.8

Distressed						
NSSI	6.2	7.0	36.4	27.5	61.1	36.4
Impulsive	32.4	25.8	20.2	19.9	43.5	33.5
Binge						
Calm						
NSSI	7.1	11.5	33.4	28.6	54.3	39.2
Impulsive	27.7	31.6	59.7	30.4	43.6	38.3
Excited						
NSSI	7.1	11.5	33.4	28.6	54.3	39.2
Impulsive	25.7	31.5	43.3	34.8	23.5	33.1
Sad						
NSSI	7.1	11.5	33.4	28.6	54.3	39.2
Impulsive	73.1	32.3	39.8	29.5	53.4	36.8
Distressed						
NSSI	7.1	11.5	33.4	28.6	54.3	39.2
Impulsive	69.5	32.6	38.9	30.9	51.1	36.7
Risky sex						
Calm						
NSSI	8.0	13.0	32.6	27.2	58.3	39.1
Impulsive	45.4	27.7	43.7	29.9	50.3	29.3
Excited						
NSSI	8.0	13.0	32.6	27.2	58.3	39.1
Impulsive	65.8	25.2	64.9	29.2	49.3	31.4
Sad						
NSSI	8.0	13.0	32.6	27.2	58.3	39.1
Impulsive	35.2	21.8	29.5	24.6	53.0	32.8
Distressed						
NSSI	8.0	13.0	32.6	27.2	58.3	39.1
Impulsive	31.4	22.8	30.5	27.5	52.8	32.0
Substance						
Calm						
NSSI	7.2	11.7	41.0	28.3	65.7	34.2
Impulsive	34.4	34.8	73.4	25.6	65.4	32.5
Excited						
NSSI	10.8	19.2	30.3	30.4	38.3	35.6
Impulsive	43.3	38.0	71.4	33.2	47.4	33.7
Sad						
NSSI	82.9	25.8	46.5	31.8	34.6	30.6
Impulsive	56.4	33.8	23.9	28.5	25.9	30.0

Distressed						
NSSI						
Impulsive						
Stealing						
Calm						
NSSI	11.3	15.3	33.5	23.4	58.4	39.2
Impulsive	27.8	20.6	21.6	24.3	44.7	32.6
Excited						
NSSI						
Impulsive						
Sad						
NSSI	82.0	26.8	46.8	33.3	33.6	32.8
Impulsive	28.8	28.1	21.3	26.2	22.2	26.4
Distressed						
NSSI	86.5	21.5	43.8	36.4	30.8	34.7
Impulsive	31.3	28.9	31.1	34.7	26.6	29.0

Note: reckless driving was not included as too few individuals engaged in this behaviour

Table 48

Descriptive statistics for main effects for NSSI x Substance use on RIBS

Substance Use	***Descriptive***	
	M	**SD**
Distressed		
NSSI	55.0	37.6
Impulsive	33.8	34.6

Table 49

Descriptive statistics for main effects for NSSI x Stealing on RIBS

Stealing	***Descriptive***	
	M	**SD**
Excited		
NSSI	29.3	30.4
Impulsive	67.0	32.4

APPENDIX G

Unpublished Scales used in Study 3

Motivation for self-harm Scale

I would like to look at the reasons why you injure yourself. The response to the following questions could be *not at all, a little* or *a great deal*. Please tick the response that best describes you.

	Did You?...	**Not at all**	**A little**	**A great deal**
1	Want to die?	1	2	3
2	Feel that there was no hope?	1	2	3
3	Feel like a failure?	1	2	3
4	Feel that you had let others down?	1	2	3
5	Feel sad?	1	2	3
6	Want to make someone sorry?	1	2	3
7	Feel angry?	1	2	3
8	Think “I’ll show him/her”?	1	2	3
9	Think that it would upset someone?	1	2	3
10	Want to teach someone a lesson?	1	2	3
11	Feel lonely?	1	2	3
12	Feel that you weren’t needed?	1	2	3
13	Feel that you’d been left out of things?	1	2	3

14	Feel that you'd been hurt?	1	2	3
15	Feel that someone wanted you out of the way?	1	2	3
16	Want someone to be different towards you?	1	2	3
17	Hope that someone would change?	1	2	3
18	Feel that it was the only way to make someone see what they were doing to you?	1	2	3
19	Feel it was a way of making others understand you?	1	2	3
20	Feel you couldn't bear for someone to leave?	1	2	3
21	Think, "if others can do it so can I"?	1	2	3
22	Have anyone in your family speak about injuring themselves?	1	2	3
23	Know anyone else who injured themselves?	1	2	3
24	Hear about self-injury on TV, radio, internet, or read about it newspapers or magazines?	1	2	3
25	Think that the fact that others do it affects you?	1	2	3
26	Feel like you just had to get away from it all?	1	2	3
27	Feel you just wanted to die?	1	2	3
28	feel you had to get away while things straightened themselves out?	1	2	3
29	Feel you couldn't put up with it much more?	1	2	3
30	Feel you wanted to leave it to others to sort out?	1	2	3

31	Feel so tense you had to do something?	1	2	3
32	Feel anxious and feel like it was the only way of coping?	1	2	3
33	Feel like everything seemed not quite real before you did it?	1	2	3
34	Feel like it hurt as much as you thought it would?	1	2	3
35	Feel less anxious after you had done it?	1	2	3
36	Feel you didn't really care if you lived or died?	1	2	3
37	Feel uncertain if you wanted to live or die?	1	2	3
38	Feel you would take a chance on whether you lived or died?	1	2	3
39	Feel you wanted to live, but also wanted to die?	1	2	3
40	Feel that it didn't matter if you lived or died?	1	2	3
41	Feel that you deserved to be punished?	1	2	3
42	Feel guilty?	1	2	3
43	Feel like you hated yourself?	1	2	3
44	Feel that you were a bad and worthless person?	1	2	3
45	Feel that you had to punish yourself for something you had done?	1	2	3

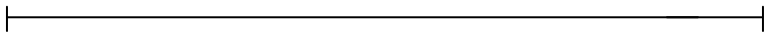
APPENDIX H

Visual Analogue Scales used in Study 3

Cognitive VAS items

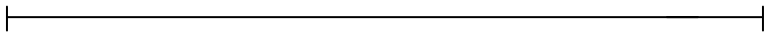
I view the event as positive

Strongly disagree Strongly agree



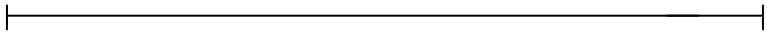
I like to hurt myself

Strongly disagree Strongly agree



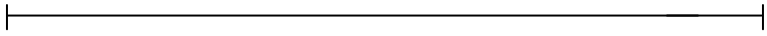
I hate myself

Strongly disagree Strongly agree



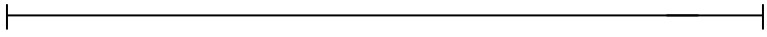
I'm a bad person so I have to engage in this behaviour

Strongly disagree Strongly agree



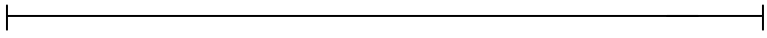
I can't stand this any longer

Strongly disagree Strongly agree



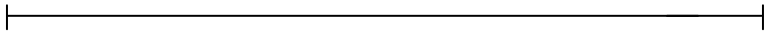
I need to engage in this behaviour to relax

Strongly disagree Strongly agree



I need to do something drastic so that people will understand how I'm feeling

Strongly disagree Strongly agree



Unless I engage in this behaviour, no-one will know how terribe I feel

Strongly disagree Strongly agree

APPENDIX I

Descriptive statistics for Study 3

Psychological responses (responses to imagery on cognitive VAS items)

Script x Stage x Group Means and Standard Deviations for cognitive VAS items

Table 50

Mean scores and standard deviations for the cognitive VAS measures for each stage of each script for BPD and NBPD participants

VAS Item	*Scene*		*Approach*		*Incident*		*Consequence*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
View event +ve								
NSSI								
BPD	20.8	25.0	25.8	29.5	34.3	35.6	49.5	38.6
NBPD	20.0	26.1	16.3	22.3	21.8	30.7	34.8	32.8
Accidental injury								
BPD	74.5	28.3	68.5	31.4	25.9	30.4	48.1	35.4
NBPD	65.1	27.2	55.5	29.7	15.8	23.9	30.5	31.4
Neutral								
BPD	79.9	17.8	82.4	17.4	76.9	28.2	85.1	18.0
NBPD	72.8	19.5	75.0	24.1	77.4	22.0	76.1	24.9
Like hurt								
NSSI								
BPD	53.1	31.6	61.7	32.9	67.2	36.1	55.7	38.0
NBPD	39.4	34.4	38.6	36.1	51.8	35.9	38.1	32.8
Accidental injury								
BPD	8.0	23.0	10.0	24.4	11.1	24.8	12.1	27.3
NBPD	13.3	24.9	12.9	23.4	10.8	22.1	11.2	23.2
Neutral								
BPD	10.2	21.3	6.9	18.7	6.0	17.1	5.4	16.8
NBPD	8.9	14.3	5.9	10.2	7.5	13.7	5.6	12.2
Hate myself								
NSSI								
BPD	65.6	32.0	64.8	35.3	69.4	37.3	61.7	37.9
NBPD	51.0	41.2	54.9	40.7	56.2	40.9	48.7	39.7

Accidental injury								
BPD	14.0	25.7	12.2	31.0	14.5	25.7	10.9	21.8
NBPD	15.4	27.2	14.7	27.0	15.9	26.1	16.3	29.7
Neutral								
BPD	7.3	14.3	4.2	8.8	5.2	11.8	2.8	6.0
NBPD	7.3	12.8	5.0	10.3	4.9	9.8	4.4	8.9
I'm bad								
NSSI								
BPD	39.5	34.6	48.1	37.3	49.4	37.4	40.6	38.8
NBPD	34.3	37.0	35.7	39.7	37.8	43.1	33.3	39.1
Accidental injury								
BPD	5.9	18.4	5.5	18.2	7.5	19.3	5.9	18.2
NBPD	11.4	23.4	11.6	22.8	11.2	20.7	10.1	20.0
Neutral								
BPD	4.5	11.9	3.4	9.0	3.1	8.7	2.0	3.9
NBPD	5.0	10.4	5.0	10.2	4.9	9.8	4.1	9.1
I can't stand it								
NSSI								
BPD	71.8	32.2	75.2	31.8	77.7	30.5	49.2	36.3
NBPD	59.4	35.2	68.4	33.6	60.2	41.7	44.4	36.1
Accidental injury								
BPD	15.3	29.2	11.0	20.9	27.0	32.3	23.5	32.5
NBPD	12.3	24.3	12.6	22.6	30.4	35.5	32.5	37.4
Neutral								
BPD	7.8	18.4	7.1	18.1	4.8	14.9	3.3	6.2
BPD	5.4	10.8	5.9	13.0	4.5	9.5	4.0	9.0
Need to relax								
NSSI								
BPD	51.1	34.8	60.1	37.1	74.3	30.3	52.2	36.5
NBPD	46.2	35.7	55.5	38.0	66.7	34.0	48.3	32.9
Accidental injury								
BPD	12.0	24.1	19.4	34.6	8.9	24.7	11.5	28.6
NBPD	12.8	24.1	13.7	26.4	7.1	19.2	9.3	20.2
Neutral								
BPD	16.0	27.7	13.5	25.0	12.0	27.3	11.9	26.6
NBPD	14.3	24.3	9.6	21.1	9.3	27.3	9.3	20.4

For understanding								
NSSI								
BPD	46.7	42.1	52.1	41.0	53.5	43.3	37.8	38.1
NBPD	27.0	33.2	28.3	34.7	37.9	41.2	26.7	34.3
Accidental injury								
BPD	12.5	25.9	12.6	25.1	18.5	29.6	18.1	31.7
NBPD	9.3	21.6	9.3	20.0	10.2	20.0	5.5	7.8
Neutral								
BPD	5.4	15.7	7.5	18.8	4.4	15.4	4.5	15.9
NBPD	5.5	11.0	5.2	10.4	5.2	9.9	4.9	9.7
Show how terrible								
NSSI								
BPD	40.2	39.4	47.6	40.4	55.2	41.9	39.3	39.5
NBPD	24.6	31.0	26.7	32.7	39.0	40.8	22.9	29.8
Accidental injury								
BPD	6.0	18.3	6.8	18.6	6.9	12.9	6.9	17.4
NBPD	7.9	20.6	8.4	19.7	5.3	8.0	4.4	6.6
Neutral								
BPD	2.8	6.3	3.1	8.4	1.9	3.3	1.6	2.3
NBPD	5.6	10.9	5.5	10.7	4.6	9.3	4.7	9.2

Psychological responses continued

Means table for Script x Stage for cognitive VAS

Table 51

Means and standard deviations for cognitive VAS items comparing script by stage

VAS Item	*Scene*		*Approach*		*Incident*		*Consequence*	
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
View event +ve								
NSSI	20.4	25.4	21.1	26.3	28.1	33.6	42.2	36.6
Accidental injury	69.8	27.9	62.0	31.0	20.8	27.6	39.3	34.3
Neutral	76.3	18.8	78.6	21.2	77.1	25.1	80.6	22.0
Like hurt								
NSSI	46.3	33.5	50.2	36.2	59.5	36.5	46.9	36.3
Accidental injury	10.6	23.9	11.5	23.7	10.9	23.3	11.7	25.1
Neutral	9.5	18.0	6.4	14.9	6.7	15.4	5.5	14.6
Hate myself								
NSSI								
Accidental injury		N/A				N/A		
Neutral								
I'm bad								
NSSI								
Accidental injury		N/A				N/A		
Neutral								
Can't stand it								
NSSI	65.6	34.0	71.8	32.6	69.0	37.3	46.8	36.0
Accidental injury	13.8	26.7	11.8	21.6	28.7	33.7	28.0	35.2
Neutral	6.6	15.0	6.5	15.6	4.6	12.4	3.6	7.7
Need to relax								
NSSI	48.6	35.0	57.8	37.3	70.5	32.1	50.2	34.6
Accidental injury	12.4	24.3	16.5	30.6	8.0	22.0	10.4	24.6
Neutral	15.2	25.8	11.5	23.0	10.6	23.8	10.6	23.5

For understanding								
NSSI	36.8	38.9	40.2	39.5	45.7	42.6	32.3	36.4
Accidental injury	10.9	23.7	10.9	22.5	14.3	25.4	11.8	23.7
Neutral	5.4	13.5	6.3	15.1	4.8	12.8	4.7	13.0
Show how terrible								
NSSI	32.4	36.0	37.2	38.0	47.1	41.5	31.1	35.7
Accidental injury	6.9	19.3	7.6	19.0	6.1	10.7	5.6	13.1
Neutral	4.2	9.0	4.3	9.6	3.2	7.1	3.2	6.9

Table 52

Descriptive statistics for group x script interactions for the cognitive VAS items, I like to hurt myself and to show how terrible I feel

Script	***NSSI***		***Accidental injury***		***Neutral***	
	M	**SD**	**M**	**SD**	**M**	**SD**
Like hurt						
BPD	59.4	34.7	10.3	24.6	7.1	18.4
NBPD	42.0	34.9	12.1	23.1	7.0	12.6
Terrible						
BPD	45.6	40.3	6.7	16.7	2.3	5.6
NPD	28.3	33.8	6.5	15.1	5.1	10.0

Main effects for cognitive VAS

Table 53

Descriptive statistics accompanying main effects for cognitive VAS items

Cognitive VAS Item	***Descriptive*** **M**	**SD**
Hate Self		
NSSI	59.0	35.4
AI	14.2	24.1
N	5.1	9.5
I'm bad		
NSSI	39.8	38.3
AI	8.7	20.0
N	4.0	9.3

Belief Scale results

Table 54

Belief Scale scores for BPD and NBPD groups

Belief		Group BPD	Group NBPD	Analysis
Competent	M	7.9	7.5	$t(55) = 0.7$, $p>.05$
	SD	1.9	2.1	
Approval	M	8.0	7.5	$t(55) = 0.9$, $p>.05$
	SD	1.9	2.1	
Evil	M	6.2	5.1	$t(55) = 1.9$, $p>.05$
	SD	2.4	2.4	
Past influences emotions	M	6.9	5.4	$t(55) = 2.2$, $p<.04$*
	SD	2.5	2.6	
Emo. External ctrl.	M	7.3	6.9	$t(55) = 1.0$, $p>.05$
	SD	1.6	1.6	
Anxious danger	M	7.9	6.8	$t(55) = 2.1$, $p<.04$*
	SD	2.0	1.8	
Life easier	M	7.5	6.1	$t(55) = 3.0$, $p<.004$*
	SD	1.7	1.8	
Awful unfair	M	7.2	5.8	$t(54) = 2.5$, $p<.02$*
	SD	1.9	2.4	
Avoid resp.	M	4.7	4.4	$t(54) = 0.6$, $p>.05$
	SD	1.9	1.8	
Hate uncertain	M	8.6	8.0	$t(55) = 1.4$, $p>.05$
	SD	1.6	1.7	

* indicates a significant result

STAXI-II results

Table 55

Differences in anger for BPD and Non-BPD groups

STAXI-II Scale		Group BPD	Group NBPD	Analysis
State anger				
S-Ang	M	23.2	19.6	$t(56) = 1.7$, $p>.05$
	SD	7.7	8.2	
S-Ang/F	M	8.8	7.6	$t(56) = 1.2$, $p>.05$
	SD	3.0	4.5	
S-Ang/V	M	7.3	6.8	$t(56) = 0.6$, $p>.05$
	SD	3.7	3.0	
S-Ang/P	M	6.7	5.8	$t(56) = 1.6$, $p>.05$
	SD	1.9	2.3	
Trait anger				
T-Ang	M	24.0	17.9	$t(56) = 3.7$, $p<.0004$*
	SD	6.4	6.0	
T-Ang/T	M	8.5	6.2	$t(56) = 2.9$, $p<.006$*
	SD	3.3	2.9	
T-Ang/R	M	10.8	8.8	$t(56) = 2.5$, $p<.02$*
	SD	2.9	3.1	
AX-O	M	17.8	15.1	$t(56) = 2.2$, $p<.04$*
	SD	5.3	4.3	
AX-I	M	21.8	19.4	$t(56) = 1.9$, $p>.05$
	SD	4.3	5.2	
AC-O	M	21.1	24.4	$t(56) = 2.4$, $p<.02$*
	SD	5.9	4.3	
AC-I	M	18.9	22.2	$t(56) = 2.4$, $p<.03$*
	SD	5.9	4.4	
AX Index	M	47.8	35.9	$t(56) = 3.3$, $p<.002$*
	SD	14.2	12.8	

* indicates significant result

Eysenck Impulsivity Scale results

Table 56

Eysenck Impulsivity Scale scores for BPD and NBPD groups

EIS Scale		Group BPD	Group NBPD	Analysis
Impulsiveness	M	13.4	8.9	$t(56) = 4.1$, $p<.0001$*
	SD	4.4	4.1	
Venturesome	M	10.6	8.8	$t(56) = 1.5$, $p>.05$
	SD	3.7	5.1	
Empathy	M	15.4	14.4	$t(56) = 1.0$, $p>.05$
	SD	4.1	3.3	

* indicates a significant result

Reasons for Living-48 (RFL-48) results

Table 57

RFL-48 scores for BPD and NBPD groups

Reason for Living		Group BPD	Group NBPD	Analysis
Survival	M	3.4	4.1	$t(53) = 2.3$, $p<.03$*
	SD	1.2	1.1	
Responsibility	M	4.4	4.4	$t(53) = 0.1$, $p>.05$
	SD	1.2	1.3	
Children	M	3.0	2.3	$t(53) = 1.5$, $p>.05$
	SD	1.9	1.6	
Fear suicide	M	2.9	2.7	$t(53) = 0.6$, $p>.05$
	SD	1.2	1.3	
Fear social	M	2.8	3.0	$t(53) = 0.4$, $p>.05$
	SD	1.5	1.6	
Moral reasons	M	1.9	2.2	$t(53) = 0.7$, $p>.05$
	SD	1.4	1.4	
Mean	M	3.2	3.6	$t(53) = 1.4$, $p>.05$
	SD	0.9	0.8	
Total	M	156.2	170.5	$t(53) = 1.3$, $p>.05$
	SD	42.3	37.5	

* indicates a significant result

Motivation for Self-Harm Scale (MFSH) results

Table 58

Motivation for Self-Harm (MFSH) scores for BPD and NBPD groups

Motivation		Group BPD	Group NBPD	Analysis
Depression	M	12.0	11.2	$t(55) = 1.3$, $p>.05$
	SD	2.0	2.4	
Extrapunitive	M	10.0	8.3	$t(55) = 2.2$, $p<.04$*
	SD	3.2	2.6	
Alienation	M	11.3	11.1	$t(55) = 0.2$, $p>.05$
	SD	2.9	2.4	
Operant	M	9.9	8.0	$t(55) = 2.3$, $p<.03$*
	SD	3.2	3.0	
Modelling	M	7.9	7.8	$t(55) = 0.2$, $p>.05$
	SD	2.2	2.3	
Avoidance	M	11.2	10.3	$t(54) = 1.4$, $p>.05$
	SD	2.4	2.6	
Tension Red.	M	11.9	11.7	$t(54) = 0.2$, $p>.05$
	SD	2.1	2.2	
Janus Face	M	10.4	10.1	$t(54) = 0.4$, $p>.05$
	SD	3.0	3.1	
Intropunitive	M	11.0	10.2	$t(54) = 0.9$, $p>.05$
	SD	3.0	3.7	

* indicates significant result

MCMI-III personality pathology results

Table 59

Percentages of participants experiencing personality pathology (Axis-II) in BPD and NBPD groups from the MCMI-III

Personality Scale	Cut-off score	Group		Analysis
		BPD	NBPD	
Schizoid	<75	82.8	79.3	$\chi^2(2, N = 58) = 2.3, p>.05$.
	75+	6.9	17.2	
	85+	10.3	3.4	
Avoidant	<75	55.2	75.9	$\chi^2(2, N = 58) = 3.8, p>.05$.
	75+	20.7	17.2	
	85+	24.1	6.9	
Depressive	<75	41.4	51.7	$\chi^2(2, N = 58) = 2.9, p>.05$.
	75+	13.8	24.1	
	85+	44.8	24.1	
Dependent	<75	48.3	75.9	$\chi^2(2, N = 58) = 4.7, p>.05$.
	75+	17.2	6.9	
	85+	34.5	17.2	
Histrionic	<75	89.7	89.7	$\chi^2(2, N = 58) = 0.7, p>.05$.
	75+	6.9	3.4	
	85+	3.4	6.9	
Narcissistic	<75	82.8	89.7	$\chi^2(2, N = 58) = 0.6, p>.05$.
	75+	6.9	3.4	
	85+	10.3	6.9	
Antisocial	<75	65.5	79.3	$\chi^2(2, N = 58) = 4.4, p>.05$.
	75+	20.7	20.7	
	85+	13.8	0.0	
Sadistic	<75	72.4	96.5	$\chi^2(2, N = 58) = 6.5, p<.04$*
	75+	3.4	0.0	
	85+	24.1	3.4	

Compulsive	<75	100	93.1	$\chi^2(2, N = 58) = 2.1, p>.05.$
	75+	0.0	6.9	
	85+	n/a	n/a	
Negativistic	<75	44.8	82.8	$\chi^2(2, N = 58) = 9.3, p<.01$*
	75+	41.4	10.3	
	85+	13.8	6.9	
Masochistic	<75	34.5	75.9	$\chi^2(2, N = 58) = 10.2, p<.007$*
	75+	34.5	10.3	
	85+	31.0	13.8	
Schizotypal	<75	89.7	93.1	$\chi^2(2, N = 58) = 1.0, p>.05.$
	75+	3.4	0.0	
	85+	6.9	6.9	
Borderline	<75	13.8	93.1	$\chi^2(2, N = 58) = 37.1, p<.0001$*
	75+	48.3	6.9	
	85+	37.9	0.0	
Paranoid	<75	75.9	93.1	$\chi^2(2, N = 58) = 3.3, p>.05.$
	75+	13.8	3.4	
	85+	10.3	3.4	

* indicates significant result

MCMI-III clinical syndromes

Table 60

Percentages of participants experiencing clinical syndromes (Axis-I) in BPD and NBPD groups from the MCMI-III

Clinical syndrome	Cut-off score	Group		Analysis
		BPD	NBPD	
Anxiety	<75	6.9	31.0	$\chi^2(2, N = 58) = 5.9$, $p>.05$.
	75+	55.2	34.5	
	85+	37.9	34.5	
Somatoform	<75	86.2	79.3	$\chi^2(2, N = 58) = 1.18$, $p>.05$.
	75+	10.3	10.3	
	85+	3.4	10.3	
Bipolar	<75	58.6	82.8	$\chi^2(2, N = 58) = 4.1$, $p>.05$.
	75+	6.9	3.4	
	85+	34.5	13.8	
Dysthymia	<75	65.5	69.0	$\chi^2(2, N = 58) = 2.6$, $p>.05$.
	75+	34.5	24.1	
	85+	0.0	6.9	
Alcohol	<75	75.9	82.8	$\chi^2(2, N = 58) = 0.7$, $p>.05$.
	75+	10.3	10.3	
	85+	13.8	6.9	
Drug	<75	79.3	82.8	$\chi^2(2, N = 58) = 3.0$, $p>.05$.
	75+	0.0	6.9	
	85+	20.7	10.3	
PTSD	<75	79.3	86.2	$\chi^2(2, N = 58) = 1.1$, $p>.05$.
	75+	10.3	3.4	
	85+	10.3	10.3	
Thought disorder	<75	72.4	100	$\chi^2(2, N = 58) = 9.3$, $p<.01$*
	75+	13.8	0.0	
	85+	13.8	0.0	

Major Depression	<75	55.2	79.3	$\chi^2(2, N = 58) = 4.2, p>.05.$
	75+	13.8	3.4	
	85+	31.0	17.2	
Delusional Disorder	<75	86.2	93.1	$\chi^2(2, N = 58) = 1.1, p>.05.$
	75+	3.4	3.4	
	85+	10.3	3.4	

* indicates significant result

Table 61

Mean group scores on the MCMI-III (including scores below 75)

MCMI-III Subscale		Descriptives M	SD	Analysis
Schizoid	BPD	59.3	20.2	$t(56) = 0.3, p>.05$
	NBPD	57.3	25.8	
Avoid	BPD	70.7	21.7	$t(56) = 1.9, p>.05$
	NBPD	59.0	24.1	
Depressive	BPD	77.0	19.3	$t(56) = 1.8, p>.05$
	NBPD	65.4	27.7	
Dependent	BPD	71.6	21.1	$t(56) = 3.3, p<.002$*
	NBPD	51.2	25.4	
Histrionic	BPD	43.6	24.0	$t(56) = 0.3, p>.05$
	NBPD	45.6	22.9	
Narcissistic	BPD	54.4	26.9	$t(56) = 0.1, p>.05$
	NBPD	55.0	19.5	
Antisocial	BPD	67.9	18.1	$t(56) = 2.7, p<.009$*
	NBPD	53.2	22.6	
Sadist	BPD	70.9	14.8	$t(56) = 4.4, p<.0001$*
	NBPD	48.8	22.4	
Compulsive	BPD	31.6	16.5	$t(56) = 4.3, p<.0001$*
	NBPD	50.2	16.1	
Negativistic	BPD	72.9	16.3	$t(56) = 4.4, p<.0001$*
	NBPD	47.0	26.8	
Masochistic	BPD	77.2	15.1	$t(56) = 4.0, p<.0002$*
	NBPD	51.6	30.8	
Schizotypal	BPD	68.4	8.4	$t(56) = 3.7, p<.0006$*
	NBPD	54.9	18.0	
BPD	BPD	81.7	14.6	$t(56) = 5.9, p<.0001$*
	NBPD	54.9	18.0	
Paranoid	BPD	65.9	16.6	$t(56) = 3.1, p<.004$*
	NBPD	47.0	28.7	

Anxious	BPD	82.2	10.0	$t(56) = 2.7, p<.01$
	NBPD	66.5	30.1	
Somatic	BPD	60.3	17.5	$t(56) = 1.2, p>.05$
	NBPD	53.1	27.3	
Bipolar	BPD	77.8	19.7	$t(56) = 3.1, p<.004$*
	NBPD	59.2	26.0	
Dysthymic	BPD	64.1	16.7	$t(56) = 2.8, p<.007$*
	NBPD	43.7	35.4	
Alcohol	BPD	66.5	20.3	$t(56) = 2.5, p<.02$*
	NBPD	50.3	28.1	
Drugs	BPD	64.8	23.7	$t(56) = 1.3, p>.05$
	NBPD	56.9	23.8	
PTSD	BPD	68.2	15.5	$t(56) = 2.1, p<.05$*
	NBPD	56.2	26.9	
Thought Dis.	BPD	68.0	15.7	$t(56) = 4.1, p<.0001$*
	NBPD	47.1	22.1	
Depression	BPD	69.9	20.6	$t(56) = 2.8, p<.008$*
	NBPD	50.2	32.4	
Delusional	BPD	55.1	26.3	$t(56) = 2.6, p<.02$*
	NBPD	34.7	32.2	

* indicates significant result

APPENDIX J

Examples of Imagery Scripts

NONSUICIDAL SELF-INJURY (BPD participant)

Scene

Right. I want you to imagine that it's about 3 or 4 year ago and you're in college. You've just come home to an empty house and you're feeling stressed. **Concentrate on that feeling right now [pause].** You're sitting in the lounge room digging yourself into an emotional hole. You're thinking about your breakup and the feeling in the pit of your stomach. You're breathing fast and you feel distressed. You really notice the feeling in your stomach. **Concentrate on that right now [pause]. Now open your eyes and switch that scene off.**

Approach

Close your eyes. You get up and go down to the shed. You notice how large it is. You start to move towards the scalpel blades. See them sitting in front of you, sealed on the work bench. You pick up a razor and notice that you're starting to feel a sense of excitement. **Concentrate on that feeling right now [pause].** Now you turn the music on and take your jumper off. You draw the blade out of its seal. You sit and admire the beauty of it. You can feel the sub bouncing around the shed. The razor is so beautiful and shiny, it makes you feel happy. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

Incident

Close your eyes. You push the razor blade down and make a cut into your left arm. Feel the skin slicing open. It's intoxicating. You drag the blade so that it runs from the base of your wrist up to your elbow. It's one of the best cuts you've ever made. You get a big rush. You're starting to feel more lifted. **Concentrate on that feeling right now [pause].** You make two more cuts, each one of them deeper. You are trying to make as much blood as you can, pushing the skin apart and looking for the veins. You take a small taste of your blood to seal the deal. Taste the copper in your mouth. It's better than sex. You feel awake and alert, as you hold your arm in different positions trying to make the blood run. This is amazing. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

Consequence

Close your eyes. The feeling starts to wear off a bit. You are disappointed but it's ok. You forget about everyone and everything. You take very deep breaths and you feel more awake and more powerful. You think about how it's like you've been asleep and now you feel more awake. **Concentrate on that feeling right now [pause].** You get a bandage out of the first aid kit and start to clean up. You wipe off the blood with some gauze and shove the evidence in your pocket. You'll get rid of it later. You reach out and press the skip button on the stereo. You change the music to something with more speed and sit and relish in the feeling of being more awake. **Concentrate on that thought right now [pause]. Now open your eyes and switch that scene off.**

NONSUICIDAL SELF-INJURY (NBPD participant)

Scene

Right. I want you to remember back to year 11. You've just moved from ... and you've been enjoying the freedom of college. Your midyear report has just come out

and you're failing. You feel apprehensive about coming home. You're worried about what your parents are going to say. **Concentrate on that feeling right now [pause].** You walk in the back door and see your dad standing in the kitchen. His face looks like a thundercloud. Really see how angry he looks. You are feeling really apprehensive and sick in your stomach. You know you are in trouble. **Concentrate on that right now [pause]. Now open your eyes and switch that scene off.**

Approach
Close your eyes. Your dad says "we need to talk". You hear the anger in his voice as he starts to yell at you. You are feeling really down. It feels like crap disappointing your family and you feel sad knowing that you'll never be good enough. **Concentrate on that thought right now [pause].** Your dad keeps screaming at you and you run for your bedroom. Hear him saying over and over what a fuck up you are. You go into your bedroom now and slam the door. You dad says "this isn't over yet", but you hear your mum saying "leave her alone". You sit on your bed feeling weak. You don't know what to do. You really want your pocket knife. **Concentrate on that thought right now [pause]. Now open your eyes and switch that scene off.**

Incident
Close your eyes. You open the knife and lightly press the blade to your index finger to test it. It's still sharp. You just want to feel better. You hold your arm out and take a deep breath. You quickly start to make little cuts. It looks like tiger stripes down your arm. You try to stop feeling upset and just focus on the pain. **Concentrate on that feeling right now [pause].** You keep focusing on the pain instead of thinking about other things. You wipe the tears from your eyes and keep cutting. Thinking about the pain helps to block everything out. It feels better. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

Consequence
Close your eyes. You feel like you're done now. You start to clean the knife straight away. You feel better, but you are ashamed. You get the alcohol wipes and take care of the wounds. You keep concentrating on the pain and think about how you don't want anyone to know what you've done, yet you feel so much calmer. **Concentrate on that feeling right now [pause].** You feel really tired as you put on a long sleeved top. You just want to get back into bed. You make yourself a cocoon, and hug the teddy that your friend gave you. You feel calm now. You can't cry any more. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

<u>NEUTRAL</u>

Scene
Right You are at home in the kitchen and it's about 4pm. See the pink walls and the cupboards. The light in the room is fairly dim. You notice the flowers that are out. You are thinking that a cup of tea would be nice. **Concentrate on that thought right now [pause].** You look over and see the kettle, the sugar and tea containers and your cup and teapot. You notice the floral pattern and the nice pastel colours. You are feeling calm. **Concentrate on that right feeling now [pause]. Now open your eyes**

and switch that scene off.

Approach
Close your eyes. You start to think about which tea you will have. You decide on lemon and green tea. You get a teabag from on of the top shelves. Notice that the box is green. You are still feeling calm. **Concentrate on that right now [pause].** Now you look over at the kettle. It already has water in it so you turn it on and start to wait for it to boil. You walk into the living room and sit on the comfy blue couch. You are thinking about how much you want a cup of tea. This is your time to wind down and focus on something for a while. **Concentrate on that thought right now [pause]. Now open your eyes and switch that scene off.**

Incident
Close your eyes. The kettle has finished boiling now so you get up and go back to your cup. You pick up the kettle and pour boiling water into your cup. Really concentrate on the steam and the smell of the tea. It's calming. **Concentrate on that right now [pause].** Now you put the kettle back and pick up your cup to take into the living room. You leave the teabag in the cup. Notice how warm your cup feels in your hands as you go back to the couch. **Concentrate on that right now [pause]. Now open your eyes and switch that scene off.**

Consequence
Close your eyes. You are sitting on the couch waiting for your tea to cool down. You like it to be hot but at the moment it's too hot. You hold the cup in your hands and keep concentrating on the smell of the tea. Notice that you are still feeling calm. **Concentrate on that right now [pause].** Now you are ready to start drinking your tea. It's nice and hot and it feels really calming. Keep noticing how it smells. You are still concentrating on feeling calm. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

ACCIDENTAL INJURY

Scene
Right. You are in your kitchen and it's during the day around lunchtime. It's summer and you've just been grocery shopping and hanging out with .... Really put yourself in the kitchen. See the old small fridge covered in photos and the bench where the toaster sits. You are feeling fairly relaxed. **Concentrate on that feeling right now [pause]**. You have been chatting about friends and are starting to think about cutting up ingredients. Notice that you are in a good mood and you're feeling happy and relaxed. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

Approach
Close your eyes. You're going to cut some onions. You're holding a knife in your right hand. It's a big knife and it has a brown handle. You notice that the tip is missing because you've just sharpened it and you broke it. You're feeling ok. **Concentrate on that feeling right now [pause].** On the bench in front of you is the wooden chopping board. It's a honey brown colour. You can rally smell the onions as you start to peel them. Notice that you are still feeling ok. **Concentrate on that**

feeling right now [pause]. Now open your eyes and switch that scene off.

Incident

Close your eyes. You start to slice though the onions. You aren't really paying attention because you are talking to....Suddenly you realise that you have slipped and you have cut the side of your finger on the middle of your left hand. It happens really fast. You notice that you are bleeding everywhere. It hurts. **Concentrate on that feeling right now [pause].** You hear yourself say "shit". You are thinking that you weren't really concentrating at all. You drop the knife and stand back from the bench. You scan the kitchen quickly for some paper towel but don't see any. You can't believe you've cut yourself. It really stings. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

Consequence

Close your eyes. You are holding your finger up as you make your way to the bathroom. It's the first door on the right. You open the door and see the toilet paper on the left. You pull off a chunk of the toilet paper and hold it against your finger. You're feeling ok but silly. **Concentrate on that feeling right now [pause].** You show ... how you are bleeding everywhere. You sit down on the white plastic bar stool and hold your finger up in the air. It still stings, but you feel like you are ok. You sit and watch as … finishes chopping everything. You tell her to be careful. **Concentrate on that thought right now. Now open your eyes and switch that scene off.**

IMPULSIVE

Scene

Right. I want you to remember back to two months ago when you are living in ... You are at home in your top level flat. See the high ceilings and the horrible red couches. You have just driven home from shopping. You know that you've bought too much food but you can't help yourself. **Concentrate on that thought right now [pause]**. You feel so hungry and you are starting to feel more stressed. You are standing near the sink and looking at the food that you have bought. See the sausages in tins, piles of chocolate and cheese slices. Some food will make you fell better. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

Approach

Close your eyes. You move the food from the sink and take it into the lounge room and put it on the coffee table. Then you sit down on the couch and look at all the food again. You can smell the cheese and the chocolate. Really concentrate on the image of the food in front of you. You start to make a sandwich, thinking about how hungry you feel. **Concentrate on that feeling right now**. You spread the bread with thick layers of margarine, and squash 5 small sausages into the bread. You so, so hungry. Your heart is racing. **Concentrate on that feeling right now [pause]. Now open your eyes and switch that scene off.**

Incident

Close your eyes. You start eating. You remember how good it feels eating the sausages. You grab handfuls of chocolate and eat that in between bites. You cannot

get this food down fast enough. You are thinking to yourself that this is the nicest food ever. You are really enjoying yourself. **Concentrate on that feeling right now [pause].** You proceed to eat more milky ways and dip them in chocolate sauce in a tin. Then you pour the tin of sauce down your throat. You eat handfuls of chips and more pieces of bread. You are slowly starting to get past the stage of feeling full, but you are still really enjoying eating your food. **Concentrate on that feeling right now. Now open your eyes and switch that scene off.**

Consequence

Close your eyes. You feel better but you quickly reach the point of no enjoyment. You start to feel sick. Your stomach feels like it's going to burst. You're now trying to put off the feeling of needing to purge. You are thinking why do I always do this? You feel gross and uncomfortable. **Concentrate on that feeling right now [pause].** You feel guilty and a bit sick. You are thinking about how you are going to have to go to the toilet so to get rid of this. You look at all the food you have consumed and feel really useless. You start to pick up the empty tins and packets and keep thinking about why you do this to yourself. You will have to hide the evidence before …. comes home. **Concentrate on that thought right now. Now open your eyes and switch that scene off.**